



COAL AGE



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Bosses and Men

YOU sometimes think that your boss doesn't understand your position—he does. You sometimes think that your boss doesn't appreciate good service—you are wrong. You sometimes think that your boss is not interested in your personal welfare—but he is. He believes in better wages and better conditions for workmen. Also, he believes firmly in trading a dollar's worth of service for a dollar's worth of currency.

He has been through the mill. He greased and coupled cars at one time. He once was a trapper-boy. He loaded coal, unloaded slate and drove a mule. He has been a timberman, a tracklayer and a motorman. He attained his present position because he did well what he was put to do, stayed on the job and thought he was as good as any man above him and no better than any man below him.

Here is what your boss is required to do: Get the largest possible output of marketable coal at the least possible cost in money and men. To do this he and his advisors decide on a plan. Then he and his assistants put that plan in operation and remove every obstacle that stands in the way.

These are obstacles:

Dissatisfaction among men; antiquated methods; carelessness; late starters; drones; trouble-makers.

Every boss seeks coöperation. No company official wishes the ill-will of his men. If you are not receiving justice, your boss will make a change; but you've got to show him first. If you are entitled to promotion or an increase in wages, you'll get it, but you'll probably have to deserve it.

Your boss is looking for up-to-date plans and up-to-date suggestions. He wants labor-saving devices, either factory or mine made. He believes in efficiency. A synonym for efficiency is commonsense; another is good judgment. If your boss can use equipment that will dispose of the services of a few men, he will naturally let these men go.

Your boss wants no accidents. He doesn't want a mine worker killed or a man hurt. He doesn't want a motor off the track or a fall of roof. He knows that carelessness is responsible for most of the accidents in mines. Therefore he is the foe of carelessness. If you want the approval of the boss, don't try for a big run at the expense of safety.

Your boss wants an 8-hr. day for 8-hr. pay. You know the starting hour. You are expected to be at your working place when the whistle blows in the morning, and in the evening. Your boss wants as much coal loaded the first hour as the second; as much the eighth hour as the seventh. He will get rid of late starters and early quitters at the first opportunity.

He tries to secure satisfaction and coöperation among his men. Personal interest in the mine on the part of every employee is his goal. He won't have his work undone by a malicious trouble-maker who seeks to stir up discord and to find a grievance where a grievance does not exist. The trouble-maker must go.

You sometimes think you are working for "a soulless corporation." You are wrong. A corporation is composed of real men, with sympathies, feelings and weaknesses such as you have; with souls just like yours. They are little cogs in the industrial machine and so are you. They feel their responsibilities and wish to give everyone a square deal. They can't give it unless you get it.

Put your own soul to work and help the officers of your company find theirs.

Ideas and Suggestions

A New Bob-Line Reflector

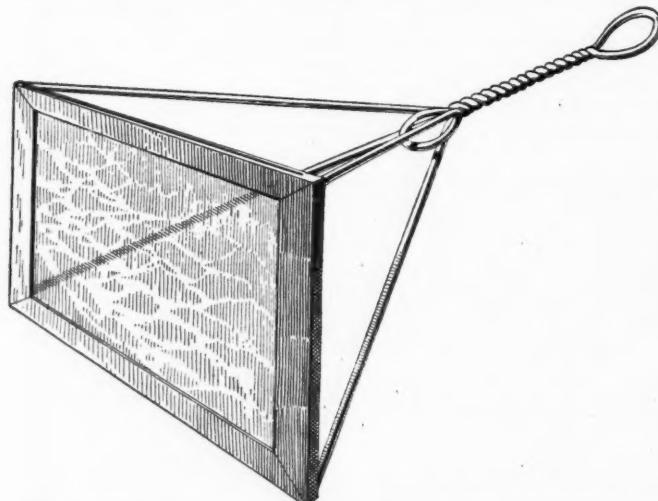
By C. S. SCHWARTZ*

In *Coal Age* of Aug. 12, page 257, appears a description and sketch of a reflector for facilitating transit sights in mines. This is merely an extension or amplification of the old practice of tearing a leaf from a notebook and pouring oil on it to increase its transparency. This practice was however often hard on the notebook.

The objection to the device described is that the tracing cloth must be given a circular cut, and while the exact method of fastening is not shown, whatever mode is used it will take time. And when the sights are to be given from "cartwheels" or other points in the roof not marked by a spad from which the plumb bob line may be hung, three hands are required: One for the device, one for the bob line, and one for the lamp. As the ordinary run of mine-survey help is provided with but two, its operation would be difficult.

The accompanying illustration shows a device that can easily be made in the blacksmith or carpenter shop. A thin frame is made to hold a half sheet of ordinary letter head or extension sheet paper, the upper edge of the frame being left open for its insertion. Four wire standards are soldered or riveted to the frame. These are carried back to a common point, and twisted into a handle, a loop being left at the common point for hooking in the carbide lamp. This loop should be far enough from the frame to prevent burning the paper.

This arrangement throws the full rays of the lamp against the paper. Letter paper is cheaper than tracing



REFLECTOR FOR USE IN UNDERGROUND SURVEYING

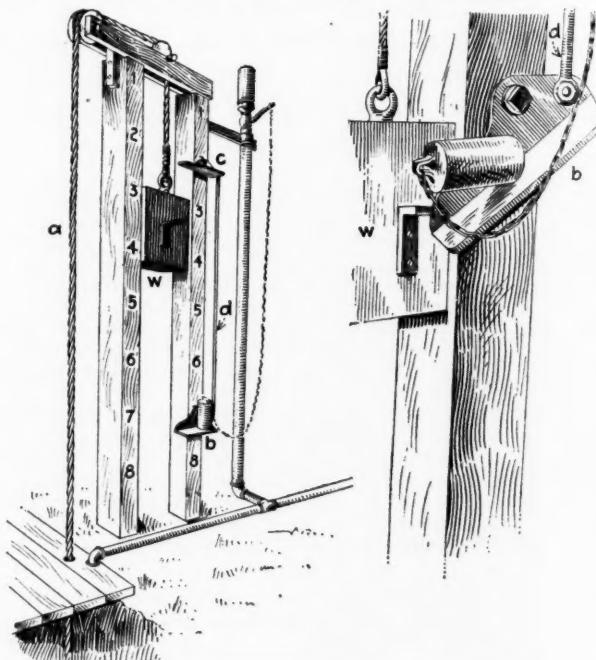
cloth and serves the purpose well. The frame or handle may be turned so as to have the long side vertical, but this is not necessary, for when it is held horizontal a sufficiently lengthy view of the bob line can be secured.

*Blairsville, Penn.

Harry From, superintendent of the Kettle Creek Coal Mining Co., Bitumen, Penn., is the inventor, promulgator, or instigator of this device. I think it more convenient than the one previously published, but it may have the effect of bringing to light something still better. Thus we improve on each other's ideas.

Sump-Pit Alarm Whistle

The alarm device shown in the illustration was used on a 48x32-in.x10-ft. stroke pump at a sump 300 ft. below the surface. On the float wire *a* we used a beer keg filled with tallow, and a weight *w* was made to balance



COMBINED INDICATOR AND ALARM

the keg. When the water rises to the 7-ft. mark, the arm on the weight upsets the pocket *b* and dumps out a small weight that is attached to the whistle valve by a light chain; when the water falls to the 2-ft. mark, the arm on the weight *w* upsets *c*, which is connected to *b* with a reach rod, and the small weight is again released and the whistle blows. Of course the whistle continues blowing until the engineer closes the valve and hangs the weight on a hook provided for the purpose. This has proved to be a very reliable alarm, says F. G. Clark of Summit Hill, Penn., in *Power*.

An Aid in Blueprinting

By F. F. JORGENSEN*

It often happens in making blueprints by sunlight that a print is over-exposed. This may be due to carelessness or may be due to varying sunlight or many other causes.

*Chief engineer, Chicago and Northwestern Railway Co. Coal Properties, Gillespie, Ill.

But if they have not been too badly "burned" it is a simple matter to save the prints. Just as soon as the burned print has been put face up in the wash water, pour over it a small amount of a weak solution of potassium bichromate ($K_2Cr_2O_7$). This potassium bichromate may be secured at nearly any drug store in crystalline form, and 5c. worth will make about a gallon of the solution. It is readily soluble in cold water and will keep indefinitely.

Prints that have been over-exposed till scarcely a line shows up in washing can be brought out perfectly by the use of the potassium bichromate solution. After applying this solution to the print in the wash water, continue washing it in the usual manner in this same water.

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Mine Labor, Capital and the Coal Consumer

BY P. L. MATHEWS*

It has no doubt occurred to many observing men that a huge economic waste is occasioned every year by the uncertainty in the operation of coal mines—uncertainty in labor, uncertainty in prices, uncertainty in transportation. These, added to the physical difficulties encountered in the mining of coal, add a burden that is felt by every individual and cause an irreparable loss in the coal resources of the nation.

One of the chief causes for this uncertainty is not hard to find and may be summed up in one word—irregularity. The effect is equally apparent: Irregularity in operation means dissatisfied labor, curtailed dividends or actual loss to capital and physical deterioration to property. In fact, a disruption of many of the important factors that make for economical and successful mining.

Individual operators have tried to offset these evils in various ways. Storage plants for anthracite, low prices in the summer, and unprofitable contracts on the basis of monthly deliveries are some of the means that have been adopted to reduce the overhead expense of idle time. Labor, on its part, has sought relief and in many cases has imposed unjust demands to protect itself during the inevitable periods of short time.

The rapid exhaustion of many of the thick coal seams and the increased expense and difficulties of operation are impressing the coal-mining industry and the public with the vital necessity of conservation. Yet many operators who are reading the signs of the times and are making conscientious and persistent efforts to elevate mining practice to a plane commensurate with the advanced ideas and ideals in American industry are seriously hampered by the ruthless exploitation and over-production of organizations whose unwise policies result in disaster to themselves and injury to the industry as a whole.

To expect a condition of supply and demand that will not fluctuate is to expect the millennium, yet it is manifestly possible for a closer unity to exist between the interests concerned. The coal-mining industry has been slow to learn and appreciate the new business policy that has firmly taken root in mercantile and manufacturing industries—a policy of "live and let live" that has superseded to a great extent the cut-throat propaganda of the "survival of the fittest." Manufacturers have found that energy expended in a concentrated effort for efficient

*Santo Tomas, Tex.

operating methods, honest and dependable service to the public and a fair reward to their employees has brought returns far beyond the most optimistic expectations.

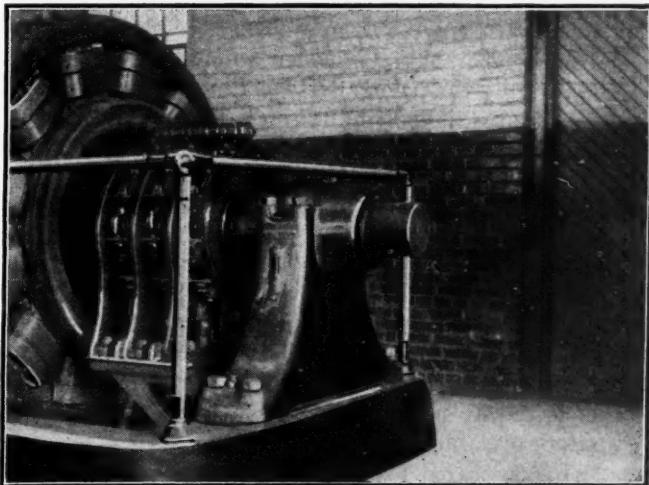
In the last analysis it becomes a question for each individual operator: Is my way of mining the most economical? Have I eliminated antiquated and wasteful methods of operation, of selling, of handling men? Am I cutting prices to a point which means loss to myself and my competitor? Am I over-developing the mine, which will eventually mean working part time and tend to increase units in wage prices? A satisfactory answer to these questions by each mine management would mean a more intimate relation between the three vital elements—labor, capital and the consumer.

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A Guard for Machinery

The accompanying illustration shows a machinery guard used around a rotary converter. This guard is simple, neat and effective. The rods, or rails, are of wood and the joints are castings. In the case shown the joints are fittings used in making railings, but pipe fittings could be used if less attention were paid to neatness of appearance.

The guard is bolted to the bedplate, thus leaving the floor free from obstruction and permitting easy access to the machine. The shaft projects several inches beyond the bearing and this projecting end is guarded by a cap made of perforated plate. A hole is left in the center of the end so that in case the armature should not weave



SIMPLE GUARD PROTECTING A ROTARY CONVERTER

a rod can be placed against the end of the shaft and the weaving started by a push.

The object of this is to prevent the scoring of the shaft, which would occur if it remained stationary longitudinally. The photograph was taken at the Diamond Supply shaft of the Delaware, Lackawanna & Western Railroad Co., Coal Department, at Scranton.

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Bronchial and Asthmatical Colliers are particularly sensitive to inconvenience from the fumes produced by explosives, even under conditions that cause absolutely no inconvenience to colliers in normal health, says W. B. Wilson. This inconvenience may be only temporary, but it is probable that the previous use of explosives in moderately ventilated rooms is in some degree the original cause of bronchitis among the aged colliers of today. If Mr. Wilson's opinion proves to be correct, the higher standards of ventilation advocated and now in practice may produce a noticeable reduction in the mortality from bronchitis among aged miners.

Mine Explosions

BY FRANK HAAS*

SYNOPSIS—It appears that the present theory of the occurrence of gas in coal mines is inadequate, since the gas encountered is much greater in quantity than could be the case if the gas came directly from the coal. The more prominent existing safeguards against dust explosions are enumerated and the possible weaknesses of each are pointed out.

A look at the record of mine explosions since the memorable winter of 1907 will leave the impression that these disasters have not been as numerous during this period as they were previously. When the increased production and the greater number of operations are taken into consideration this impression is made still stronger. The number of fatalities have little bearing on the subject, since the area over which an explosion extends is dependent on conditions existing therein rather than on the number of men employed. If an explosion occurs in a large mine more fatalities may be expected than in a small one. True, if the propagation of an explosion were under control the number of fatalities would be a measure of the frequency of such occurrences; but such, unfortunately, is not the case.

A CHANGE HAS TAKEN PLACE

Evidently there has been a change, results are different and more favorable. Coincidence may have something to do with this condition, but the time elapsed is of such extent that this possibility may be eliminated. It is much more reasonable to suppose that the consequences of the aggressive agitation which immediately followed the series of explosions in 1907 and the manner in which this has been followed up have more to do with the favorable results than any other cause. The methods by which this was done were various—the national Bureau of Mines was established, mining engineers were sent abroad to study methods and conditions in other lands, foreign engineers came to this country and above all the technical papers were profuse in publications on matters pertaining to this subject.

What appeared to be a hopeless task at the beginning developed to a favorable possibility and that to a probability. The expression that "mine explosions have happened and will continue to happen" should be barred as a discredit to intelligence. Much has been done, but not all good, in the eagerness to arrive at something definite. Theories were advanced and rash conclusions drawn, but in the process of elimination the end will be perhaps all the more certain and the sacrifice of time and labor will be recompensed.

No reflection is intended on previous workers who recognized the danger and prescribed remedies, whether right or wrong. To them belongs the credit of starting the good work. There is still much to be done and, unfortunately, misstatements and errors have been made, repeated and even found their way into textbooks. It will be necessary to eradicate completely that which is

erroneous and the problems and solutions so clearly stated that all will understand.

There was a time when the experience of a mine explosion could only be learned by personal observation, (and many fortunately have passed through an active life without such experience). This must be remedied and dependence placed on technical journals, and federal and state publications to remedy this unfortunate condition. To observe critically is not an uncommon achievement; to transmit ideas by language plain and concise is a special gift; to interpret observations requires the greatest skill, talent and experience.

There is practically a general acceptance among those who have studied the subject and followed the recent demonstrations that coal dust as well as firedamp or a combination of the two may result in explosion. Coal dust and methane differ widely both physically and chemically. It is natural to expect therefore, and it is found to be a fact, that the mode of ignition and propagation of explosions in these two substances as well as the results, are different. With a combination of the two a varying complexity will arise which makes it difficult to identify the principal agent.

For instance, in an explosive mixture of methane and air merely a spark of sufficient temperature is necessary to start an explosion, while with coal dust not only is high temperature essential but volume and duration of flame. With pure fire damp an explosion does not propagate beyond the explosive gas mixture. There may be, and usually are, manifestations of force beyond the limits of the original explosive mixture, but no indication of high temperature. With coal dust it is different. There is practically no limit to the temperature zone and inflammation may propagate over vast areas due to the fact that coal dust has a regenerative power and the quantity of air is the limiting condition rather than the quantity of dust.

EXPLOSION RESULTS DIFFER

The results of the two kinds of explosions are also quite different. In a gas explosion there is little manifestation of heat except in the immediate zone of ignition and gas mixture. The force is radiated from this point and the indications gradually grow less as the distance from the point of ignition becomes greater. The direction of force is clearly indicated in the destruction wrought and forms a reliable clew as to the origin.

With a dust explosion the results are decidedly different. Indications of temperature are greater, extending over larger but not necessarily connected areas. Nor is there but one blast of force as with a gas explosion, but a number of detonations probably so rapid as to be likened to a series of vibrations. The manifestations of force are not in one direction from the source, but may be in all directions. Therefore the direction of the force which may be indicated in the disturbance of objects in the mine does not necessarily point to the origin. The force which caused these indications may have been any one of the series, probably the greatest; possibly the last, but hardly the first.

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An important and practical difference between explosions of firedamp and coal dust lies in the fact that with firedamp the explosive force (in pounds per square inch for instance) can be fairly estimated from the known composition of the mixture. With coal dust, with its regenerative power and its rapid succession of explosions, the force is cumulative and no estimate of its intensity can be made and there appears to be practically no limit thereto. This latter feature has been plainly shown in Tafanel's as well as other experiments.

Gas or firedamp has received more attention than any other subject in coal mining and was probably recognized as a source of danger in the very beginning of the industry. Increased difficulties have made their appearance since that time, mines have been driven deeper, explosives have come into use, more men work together in one mine, electric undercutting machines and haulage motors have been introduced, all of which tend to increase the hazard.

To combat these new dangers various methods and appliances have been invented and developed. Ventilation of mines has been inaugurated; the safety lamp was discovered and perfected, safety or permissible powders with electric detonation have been introduced and we now have flame proof motors, storage battery locomotives and portable electric lamps.

MINES SHOULD BE SAFE FROM GAS EXPLOSIONS

It would appear that with these improved methods and appliances and with constant vigilance under known conditions that a coal mine should be safe from gas explosions. This is believed to be the case. Of constant vigilance little need be said for it is self-evident that with carelessness anything may happen. Known conditions are probably the weakest feature in the defense of the present system of combating gas explosions. The origin of gas, the laws governing its flow and the quantities which may be expected are apparently unknown, in other words the "where, when and how much" of gas are without satisfactory answer.

Rollin T. Chamberlin in his "Notes on Explosive Mine Gases and Dust" expresses clearly the theory of the origin of gas in coal mines which probably is generally accepted (at least it has not been seriously assailed up to this time) as follows:

The gas which escapes from coal may exist within the mass of the coal in three possible conditions:

1. It may be mechanically held or imprisoned in minute pores, cavities or cracks throughout the coal.
2. It may be occluded or dissolved within the substance of the coal; or
3. It may be the result of slowly operating chemical reactions such as those which have produced the coal from the original vegetable matter and which, still operative, might as a working hypothesis be supposed to generate gas in proportion as it is given off. . . . The ultimate source of the gases may be taken as the same under each hypothesis, for there can be little doubt that the bulk of the gas given off from coal has arisen from the slow decomposition of organic matter as a byproduct in the process which has converted vegetable humus into coal.

Mr. Chamberlin having assumed in his theory that the gas "is given off by the coal" he shows by careful laboratory experiments what its quantity is, his maximum figure being practically one and one half times the volume of the coal in a space of 26 weeks' time. He has failed to recite what actually does occur in a mine, in fact ignoring this feature entirely.

This theory does not explain why one mine will give off considerable gas and another operation adjoining with coal of identical character liberate practically none. Nor does it explain the fact that a particular mine in which careful analyses and measurements have been made each week continuously for 7 yr. has given off an average of 400,000 cu.ft. of gas per 24 hr. during that time and from all indications had liberated equally as much for 10 years previous to the time when analyses were started. This is at the rate of 20 volumes of gas to one volume of coal daily extracted. It might be added that this is not a particularly gassy operation and the quantity of gas liberated is exceeded, doubled or trebled in parts of certain mines.

No fault is found with the laboratory work carried out to substantiate the above theory but I am of the opinion that a source of gas has been overlooked which supplies an overwhelming proportion of the gas now encountered in coal mines. I am fully aware that this opinion is in direct conflict with the generally accepted ideas on this subject both in this country and abroad but a mass of information, too varied and voluminous to be set forth in this paper is available to substantiate this view.

In my opinion the source which supplies the natural gas well, and of the gas which finds its way into coal mines is the same even though a difference in the chemical composition of the gas may be detected. It is sufficient for the present to state that of the two most recent explosions attributed to gas in the Fairmont field of West Virginia both have unquestionably been caused by leakage of natural gas into the mines from defective gas wells. That this has occurred is beyond dispute. Whether this source furnishes the bulk or practically all of the gas now encountered in all mines is a matter for determination in which I hold a strongly affirmative opinion.

GAS PRESENT MAY NOT MEAN DANGER

As has been stated before, gas if in known quantities, does not indicate a particularly dangerous condition in a mine. It is surprising however how little the coal operators have availed themselves of the gas analyst who can simply and accurately determine the quantity and rate at which gas is given off. This is made compulsory by law in some foreign countries, where weekly and sometimes daily analyses of air are made in main returns and various splits.

Probably the most trying feature which may occur in a mine subject to firedamp is the accumulation of gases in gob piles or pillar falls. The formation of roof cavities and abandoned gobs are incident to mining and cannot be avoided. It is further inevitable that these become inaccessible and the control of their ventilation is to some extent lost. Methods of mining may in a large degree govern the extent of such cavities as well as certain other dangerous tendencies, but roof conditions are so variable that results cannot always be predicted.

The greatest danger lies in the accumulation of gas in inaccessible and unventilated portions of a mine, which may by a sudden falling of the roof be forced out into the working places. Should the gases emanate from the strata above the coal they will accumulate in increasing volume at the top. Diffusion is constantly at work but in stagnant space its action becomes so slow that it is safe to suspect that the foreign gas in almost pure form will exist.

Fortunately such gases are not always explosive. Some mines make practically no inflammable gas and again the firedamp may be mixed with sufficient blackdamp that it is neither explosive nor inflammable, but such circumstances cannot be relied upon. Gob gases are extremely variable in composition. Outside of variation due to mixture with air, they have been found to be almost pure blackdamp with nitrogen as the predominating element on one extreme to almost pure methane on the other.

To eliminate the hazard of such accumulation a method of limited application has been employed consisting in the removal of such gases from drill holes from the surface over such pillar falls.

By far the greatest security must be derived from vigilance and judgment based on experience. The time-honored position of fireboss apparently will resist elimination for a long time to come if but for the reason of watching gob gases alone.

If a serious condition of this kind is once discovered and realized, the solution for temporary relief is simple and entails but small hazard from explosion. This consists in directing an air current of considerable velocity into the accessible portions of the pillar fall and such as will dilute and carry off a considerable portion of the obnoxious gases.

Recent observations on actual dust explosions and experimental reproductions thereof have materially qualified the broad opinions formerly held on this subject.

It is evident that a dust explosion is an infrequent occurrence which requires the simultaneous coincidence of favorable conditions in several factors which contribute to the complete phenomena. However infrequent, comparatively, this may occur, nothing short of complete eradication will be satisfactory and it may be safe to assume that a problem with such complex conditions will not find its solution in a simple operation and he who hangs faith on a single measure leaves a wide range of possibilities for disaster.

ECONOMIC CONDITIONS DEMAND CHEAP COAL

Before the advent of explosives and electricity into the operation of coal mines and in absence of firedamp an explosion could not occur according to our present views on the subject. Economic conditions demand however that coal shall be produced cheaply as well as safely and the problem consists largely of eliminating the dangerous features in the elements which are introduced for economy. The complete elimination of dust by its removal as soon as formed or even to such an extent that safety from this source could be assumed has been considered impractical if not an impossible proposition. While it does not follow that the danger is in proportion to the amount of dust present or conversely, yet it is agreed that it should be removed as far as possible. The practice of immediately removing dust as soon as it is formed is quite generally followed.

The recent suggestion emanating from England to reduce the content of oxygen in mine air to a point where it will no longer support the combustion of coal dust nor propagate a flame has not been received with much enthusiasm. It must be admitted that in theory it is possible, but the practical difficulties are such that it would never be generally accepted. It may be reasonably assumed that the two materials, dust and air,

necessary to dust explosions can not be reduced to an extent of any material assistance toward positive safety.

Probably the most effective preventive that has been introduced is the use of explosives of minimum flame length. These have been thoroughly tested out in the experiment stations and in lieu of the word safety have been called permissible explosives. Short flame explosives strike at the very root of the difficulty. It is universally understood however that these cannot be absolutely relied upon for safety, yet if handled with the same care and the same skill as is employed with black powder, they with little doubt remove the larger proportion of the danger of ignition of coal dust which at most is of comparatively infrequent occurrence.

They have brought with them some minor dangers, particularly the powerful cap necessary for their detonation. These caps are capable of producing serious injury if accidentally exploded individually and of proportionate magnitude if collectively. They lack that "fool proof" element desirable and dependence on their safety must be placed in care of vigilance. They remove however the danger of handling loose powder.

EXPLOSIVES ARE REASONABLY SAFE

These explosives are apparently as safe in handling as can be expected of a material of such great latent force. It is to the credit of the powder manufacturers that there is available such a uniformity of products applicable to a wide range of conditions without deterioration. Failures occur, some few being chargeable to the quality of the powder and it might not be amiss to call attention to the fact that while it is a difficult matter to have a powder entered upon the permissible list it is apparently not difficult to keep it there. Whether a rigid and continuous inspection of powder should be maintained is questionable but apparently from present performance it is unnecessary. The difficulties and prejudices encountered in the introduction of permissible powders have been largely overcome and in parts of the country these powders are used from choice for reasons other than safety alone.

For the prevention of the propagation of coal dust explosions two methods have been thoroughly investigated and experiments have been carried to a point from which opinions of value have been drawn. It is noticeable that the various investigators of watering and stone dusting favor strongly the method which is most applicable to their respective conditions. It would be well, in my opinion, to classify the mines as to existing conditions before attempting to specify what the best remedy should be. This would eliminate much confusion in the interpretation of results.

For instance, it is well known that there is a wide variation in the temperature of mines, due to differences in elevation and in some cases to local heat of the strata. For mines which have a temperature of 65 deg. F. or less it is a simple matter to saturate the coal dust with water and keep it in this condition, while with temperatures above 65 deg. F. the operation becomes more difficult and expensive. In some instances it becomes prohibitive, or at least objectionable, because of its effect in diminishing the efficiency of muscular effort. This is the case where the temperature is 90 deg. F. or more. Such a temperature is not uncommon in Europe but is rarely encountered in this country.

The general plan of the mine, also the methods of mining have much to do with favoring one or the other of these methods. For instance where mines operate in several seams of considerable pitch in which the various beds are connected by rock tunnels, conditions are particularly favorable to isolating the various seams by dust barriers. Such conditions are comparatively rare in this country, particularly in the coals which are considered to be of the most explosive nature.

The fundamental principles governing the effectiveness of either watering or stone dusting are probably the same but vary in degree. Both depend on the property of the damping to absorb heat with consequent lowering of temperature of the inflamed area below the combustion point. This propensity varies in proportion to the specific heat of the inert matter applied.

Water has the advantage of possessing a higher specific heat and is more readily and conveniently applied. Dust on the other hand has the advantage of remaining where it is placed. The application of water to be effective must be continuous because of its tendency to evaporate in an atmosphere of less than 100 per cent. humidity, which is the case in nearly all mines. Should, however, the humidity be under control so that it can be continuously kept to 100 per cent. a mine once wet down by watering will remain wet and no additional moisture will be required. In fact additional sprinkling would entail superfluous labor. Fortunately the humidity can be governed and whether this control be by exhaust steam, live steam or superheated air supplemented by steam it is a simple operation and practically automatic and continuous when once installed.

The failures which have been recorded in accomplishing the desired result I believe were due to the fact that treatment of the air was not continued a sufficient length of time. The practice of using the system only during dry days or periods is not sufficient. The results both positive and negative are cumulative and favorable results cannot be immediately attained.

STONE DUST IS UNQUESTIONABLY EFFECTIVE

On the effectiveness of stone dust in its tendency to diminish the propagation of an explosion there is no question, but the damping effect is a matter of degree depending on the quantity of material used and its distribution. Difficulties present themselves in formulating a specification for the use of stone dust. It has been stated that dust when composed of 40 per cent. inert matter will no longer explode or propagate a flame, but this is modified with the statement that each and every sample of dust must be at least of such composition. Coal and rock dust do not have the tendency to intermingle like coal dust and water, nor is the diffusive action such as exists when water vapor is present.

The practical application of any explosion-damping method is a matter of doing the best possible, allowing an excess quantity to cover errors in judgment and trusting that inaccessible portions will be harmless. It is my opinion that where dust is used and the temperature will admit that the humidity of the air should be held at or near the point of saturation.

The stone dust barriers which have been recommended after severe trials have proved themselves efficient under the conditions under which they were tested. Ordinarily the mines in this country are not laid out in such a

manner as to make the application of such barriers practical.

So far as an explosion is concerned a mine is divided into units which are identical with the various splits. It is safe to assume that if a dust explosion is not limited to the room or working face in which it originates it will spread with destructive results over the entire split. It will be possible by stone dust barriers to limit the flame to an individual split but even this in itself is a catastrophe. Furthermore it has been observed in some explosions that the compressive force developed in one split was sufficient to produce fatal results from pressure alone in the adjoining split.

I believe it possible that if dust barriers are contemplated, a mine could be laid out wherein they could be very advantageously used. As it requires about 10 yr. to introduce, operate and prove out a new system of mining it is doubtful whether the stone dust barriers will receive much consideration at present unless conditions are already favorable.

With all the work that has been done and the numerous and sometimes contradictory opinions expressed, we naturally expect and find a diversity of practice. While the common theories are generally accepted the intrusion of individual hobbies are not infrequent. Themselves either harmless or of no advantage these at least stimulate the idea of explosion prevention and encourage effort to make mines safe. The statement may be made that the greatest progress has been accomplished in individual effort, supervision and vigilance. The slogan of "Safety First" is having its effect and free discussion of matters of safety is now the rule where formerly it appeared to be a forbidden subject.

Substantial progress has been made, and in this lies encouragement for better effort and the feeling that the era has been entered where explosions will be a rarity with complete eradication possible.

Brush and T-Slot Scraper

Realizing the value of combining tools that are used in connection with one another, says David Major in *American Machinist*, I contrived the device shown



COMBINATION BRUSH AND T-SLOT SCRAPER

in the illustration. It consists of a machine T-slot scraper and a brush. Chips can readily be removed from blocked and crowded slots with the scraper, which is made of cold-rolled steel and screwed onto the back end of the brush. Then when the chips are freed, the brush is brought into play to remove them and clean up the table. It is evident that time is saved by such a contrivance in place of two separate articles.

An Analysis of the Motor-Truck Question

SYNOPSIS—So many conflicting opinions prevail concerning motor-truck practice in different sections of the country that there is much confusion in the coal industry as to the exact status of this mode of transportation. In this article is presented a comparative summary of the methods employed in the leading cities, showing the contradictory opinions held and the great variation in practice.

BOSTON

1. Including places like Milton, Revere, Brookline, Cambridge, Chelsea, all parts of metropolitan Boston, the local consumption of anthracite approximates 1,750,000 tons and bituminous about 1,000,000 tons, or in the proportion of 63.7 per cent. and 36.3 per cent.

2. The consensus of opinion seems to be that the tendency is toward the 2-ton rather than the larger truck. A good many 5-ton trucks are used, and in a few instances a 7-ton truck, but these are confined to the five or six largest dealers, who use them on big soft-coal contracts. In the business district the great bulk of coal used is bituminous, buckwheat or screenings, the two latter on account of smoke laws. It is difficult to make a flat statement, because conditions vary radically in different parts of the city. The test of a truck's value is the quantity that can be delivered per day as compared with horses, and downtown the traffic is so heavy during the day that a motor has little if any advantage in speed over a horse-drawn wagon. A 5-ton motor, to earn its way, ought to do 8 to 10 mi. per hr. The use of motors is gradually being restricted to the 2- and 3-mi. hauls

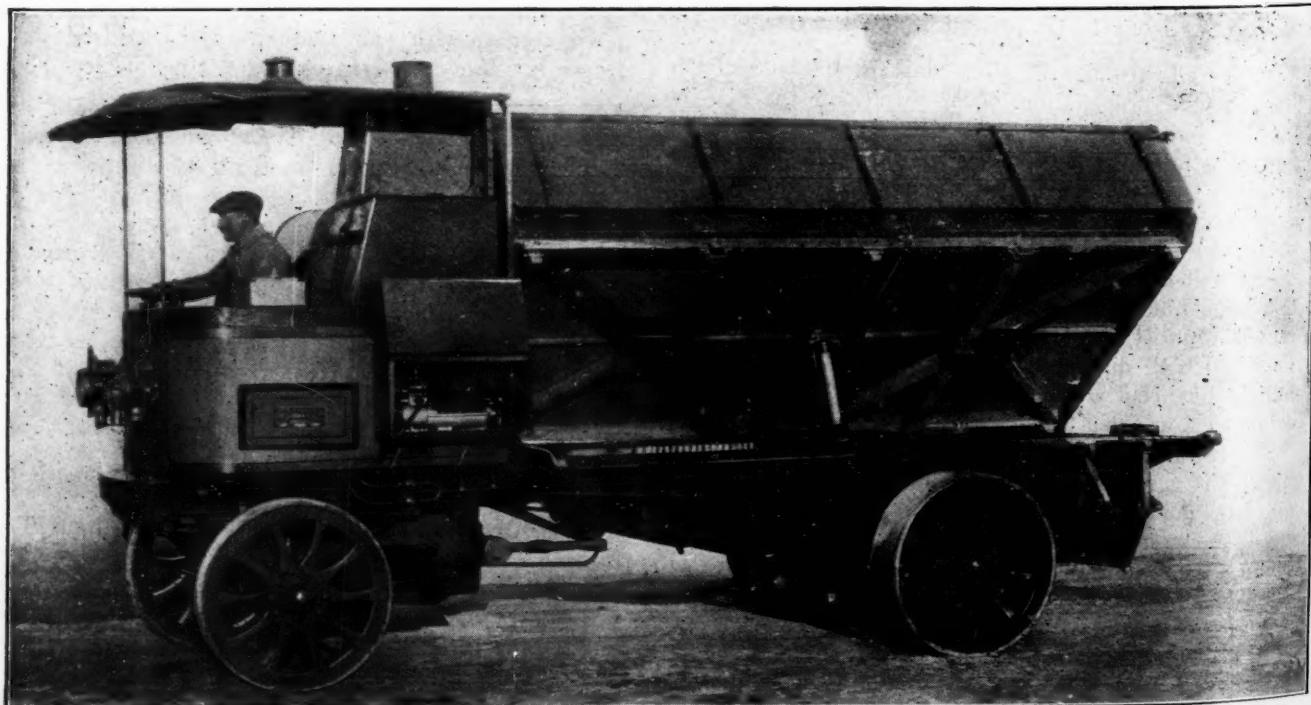
where there is less congestion and to downtown districts at night. The labor cost in the latter case is of course higher than during the day, there being a provision for "double time."

The average quantity delivered, taking the year round, is 2 tons. The percentage of 1-ton lots and that of lots above 5 tons is very small. Most of the 1-ton lots are handled by peddlers who own their own horses and wagons. To this class of distributors and to the smaller dealers with wharves of their own motor delivery has never made much of an appeal. The fact is that in this city the margin is small for the small dealer, and the best use of trucks is on bituminous, a trade that is here practically monopolized by the large dealer, who is in a position to receive coal by steamer.

The whole drift is toward the large dealer by absorption of the small distributor. The small dealer seeks to build up his tonnage on family coal, and this trade does not lend itself so well to use of motor trucks. In residential districts where there are private avenues of travel it is usually stipulated that no truck heavier than the 2-ton type shall be used.

3. The practice here is to sell short tons, or 2,000 lb. Practically the only exceptions are on United States Government business, the Post Office, etc., which require gross tons of 2,240 lb. Once in a while a state institution will insist on buying gross tons. All told, the percentage of gross tons sold would be not over 1 per cent.

4. At times the percentage delivered in bags, paper bags (20 and 25 lb.), would be perhaps 5½ per cent, but the average would not be over 3½ per cent. The use of cloth bags (100 lb.) is small and is not increasing.



FRENCH TRUCK WITH A SIDE DUMP OPERATED BY HYDRAULIC POWER



A GERMAN SIDE-DELIVERY AND AN ENGLISH END-DELIVERY TRUCK

More than 90 per cent. of coal in Boston is delivered in bulk. The labor of loading and taking bags off a truck is expensive except where the hauls are long. Most of the cloth-bag trade is with small tenements in crowded districts, and that business is handled chiefly by peddlers. A lot of coal is run into baskets and carried to a coal hole or chute. This would apply to hard coal, and is true of the Back Bay district and of places downtown where there are police regulations against chutes that cross the sidewalks. For such deliveries a horse-drawn wagon is preferred. An office building takes coal usually at night, in an alley where the coal can be dumped and then shoveled to a coal hole. In the suburbs 85 per cent. of the coal for residences is shoveled from wagons into chutes located in private driveways.

5. In Boston, trucks can only be used advantageously where dumping is quick. Dealers are showing preference for the power-driven dump as against the hand-operated. A number of couple-gear (Couple Gear Wheel Co., Michigan) trucks are in use here, but no new ones are being purchased. They are operated like the old-fashioned dump carts.

6. There are no cases of gravity discharge with the body resting permanently on the frame—that is, for

COMPARATIVE PRACTICE AND DATA FOR DIFFERENT CITIES

	Boston	New York	Philadelphia	Chicago
1 Anthracite	1,750,000 ¹	4,500,000	7%
2 Bituminous	1,000,000 ¹	1,000,000	93%
3 Size trucks	2-ton	5-ton	2-ton ⁴	6-ton
4 Unit of measure	Short ton ²	Short Ton	Long Ton	Short ton
5 % sold in bags	34%	None ³	4%	30%
6 Type of discharge	Power driven	Power driven	Power driven	
7 Is body raised	Yes	Yes	Yes	Yes
8 % End discharge	100	50	100	10
9 % Side discharge	0	50	100	90
10 Head room under coal chute	7 ft. to 8 ft.	13 ft.	7 ft. to 8 ft.	14 ft.
11 Size scales	21 ft.	18 ft. to 20 ft.	16 ft. by 8 ft.	25 ft. to 30 tons
12 Tendency of future development	2-ton	Mixed	Increasing	Increasing

¹ Includes Milton, Revere, Brookline, Cambridge and Chelsea. ² Except on Government business and occasionally on state contracts. ³ Coal sold in bags is not ordinarily delivered in New York. ⁴ The 2-ton truck is used almost exclusively although of few 3-ton and less 5-ton trucks are used.

motor trucks. On couple gear the body has to be raised vertically to get the gravity head.

7. There is no side discharge used in Boston; it is all end discharge.

8. Seven feet would be the minimum headroom under chutes, and 8 ft. the maximum; the average would be

7½ ft. This is based on answers received from eight representative dealers.

9. The most popular length scale is 21 ft., with a capacity of 20 tons. There are some of 24 ft. and some of 18 ft., but the latter are being superseded.

10. The tendency today is toward the 2-ton car. It is claimed it makes for better speed downtown, is easier to operate in crowded streets and fits better for the distance traveled and the quantity carried, with the bulk of the 1-, 2- and 3-mi. hauls.

PHILADELPHIA

1. Anthracite, about 4,500,000 tons; bituminous, about 1,000,000 tons.

2. Two-ton trucks almost exclusively. There are a few 3-ton and fewer 5-ton trucks.

3. Long ton exclusively.

4. Less than 5 per cent. is delivered in bags, and that in the Germantown and Chestnut Hill sections of the city.

5. Power-driven dump considered far superior. Hand-operated dump now regarded as antiquated.

6. No gravity discharge trucks are in use in Philadelphia.

7. All coal trucks are end discharge; there are no side discharge trucks used in Philadelphia.

8. Chute is 7 to 8 ft. from ground, and on a 2-ton truck the top is 2 ft. from lowest point of chute. The 3-ton truck top just clears the chute.

9. Truck scales are 16x7 ft. 10 in. or 16x8 ft. The old-fashioned scales were 12x7 ft.

10. The use of coal trucks is greatly on the increase. However, there are some who say this popularity will decline, claiming the upkeep is too expensive for heavy hauling.

CHICAGO

1. Chicago consumes 93 per cent. bituminous and 7 per cent. anthracite.

2. A 5- to 6-ton truck is used mostly. Only a small percentage of the trucks are equipped with compartments for delivery of coal in small lots, and where so arranged the compartments usually hold 3 tons; in other words, an average 6-ton truck when so equipped has two compartments holding 3 tons each. Household deliveries

are largely in 1- and 2-ton lots. Deliveries to office buildings and to industrial plants not equipped with railroad sidings are usually in 5- and 6-ton lots.

While the larger retail coal yards use 5- and 6-ton trucks, there is a marked tendency among the smaller dealers to use trucks of from 3 to 4½ tons' capacity, it being claimed by them that the initial cost, and maintenance expense afterward, is much less than with the larger capacity trucks. Furthermore, some state that the amount of work which can be done with the smaller capacity trucks is from 40 to 50 per cent. more than the larger size trucks, figuring efficiency against cost.

3. All coal is sold on a short-ton basis.
4. Thirty per cent. of deliveries are made in bags.
5. Conditions are such that 90 per cent. of the trucks are equipped with a power-driven dump, 5 per cent. with a hand-operated dump, and 5 per cent. with a gravity discharge.
6. The body must be raised vertically in most cases to get a gravity head.
7. Ninety per cent. have a side or end discharge; 10 per cent. are equipped with elevating bodies.
8. The minimum headroom is approximately 8 ft. 4 in. and the maximum is from 13 to 14 ft.; the average is about 10 ft.
9. Generally 25-ft. scales are used with a capacity of 25 to 30 tons.

10. There is a marked tendency among all retail dealers and coal yards to employ motor trucks, displacing team-driven trucks, on account of lessened expense in doing the work; and it is confidently predicted that in five years' time very little coal will be hauled in the City of Chicago for retail delivery by means of teams. A tendency is also noticeable on the part of mine owners to place in service 1 and 1½-ton trucks for the hauling of material and supplies from railroad stations and central warehouses to the mines.

Many Chicago yards are not equipped with elevated tracks, so that coal can be dumped from railroad cars into hoppers, which means that a good deal of coal must be picked off the ground in yards for loading on wagons or trucks. This has had the effect in some cases of deferring the purchase of motor trucks on the part of retail dealers. It is simply a question of time, however, until most yards will be equipped with elevated tracks and hoppers to enable the prompt and economical handling of coal into motor trucks for retail delivery.

TYPES OF FOREIGN CARS

In the accompanying illustration is shown an English coal-dumping truck in use by the Johannesburg municipality in the Transvaal, as designed by the Lacre Motor Car Co., Ltd., of London. This truck dumps the coal at the end, while the French truck dumps the coal at the side, by a hydraulic mechanism.

Only a small amount of water is necessary for this service, the pump using 7 liters of water at a pressure of 80 kilograms. The other illustration shows a German truck developed by H. Büssing at Braunschweig.

The Lehigh Valley Coal Co. Has Paid All Its Married Men who enlisted in the army a salary while on duty sufficient when added to the army pay to equal their regular income. All single men were given half-pay while in the Government service afield. All employees affected by this announcement, which was made Aug. 4, are having their positions held open till their return.

Russian Byproducts of Coking

The production of byproducts in the coking of South Russian coal, which is of high importance to the Russian economic world, particularly in the present crisis, for the first half of 1915 showed great increase compared with previous years. According to the *Gornozavodskago Dielo*, the quantity of coal tar produced amounted to 1,656,000 poods (26,709 tons), against 1,439,000 poods (23,209 tons) for the corresponding period of the preceding year, and the amount of 25 per cent. ammoniacal water made was 628,000 poods (10,129 tons), against 528,000 poods (8,516 tons) for the corresponding period. Thus, compared with the preceding year, the quantity of tar obtained is better by 15 per cent. and ammoniacal water by 12.5 per cent. The production of the chief secondary byproducts of coking is shown in the following figures: Sulphate of ammonia, 360,000 poods (5,806 tons), against 527,000 poods (8,500 tons) in 1914; pitch, 712,000 poods (11,483 tons), against 567,000 poods (9,145 tons); heavy oil, 638,000 poods (10,290 tons), against 386,000 poods (6,225 tons).

Thus the output of sulphate of ammonia declined during the first six months of last year by 31.7 per cent. This is explained by the fact that the production was chiefly made for export as an artificial fertilizing nitrate, which is hardly used at all in Russia. The small demand for this class of fertilizer in Russia is chiefly covered by Chile saltpeter, and recently Norwegian saltpeter (nitrate of lime) and calcium cyanamide. But the production of tar increased during last year, particularly compared with the first half of the preceding year, by 25.6 per cent., which is explained by the great increase in the production of Donetz coal briquettes, for which the pitch constitutes one of the chief elements.

The production of heavy oils also largely increased because of the greater production of pitch, the two being intimately connected in the process of production. Besides this, there was an increased demand for heavy oil for treating railroad ties.

The extent of other secondary byproducts obtained, such as sal ammoniac spirit, benzol and naphthalene, has not been accurately established for want of sufficient data. Benzol, according to the limited information available from the statistical bureau of the congress of South Russian metallurgists, in the first half of the year was produced to the extent of about 97,000 poods (1,564 tons), which, compared with the first half of the preceding year, makes an increase of over 89,000 poods (1,435 tons). Compared with the corresponding period for the second half of 1914 the increase amounts to 57,000 poods (919 tons).

Compared with the corresponding figures for the second half of 1914 the production of most of the byproducts in the first half of last year on the whole has risen. The coal tar obtained increased by 165,000 poods (2,661 tons), or 11.1 per cent.; pitch by 29,000 poods (467 tons), or 4.2 per cent.; and the production of heavy oil by 121,000 poods (1,951 tons), or 23.4 per cent. But the production of ammoniacal water, on the other hand, decreased by 37,000 poods (596 tons), or 5.5 per cent., and similarly, the production of sulphate of ammonia fell away compared with the second half of last year by 40 per cent.

Sal ammoniac spirit, without full data available from the factories, was produced in the first half of 1915 to

the extent of 5,982 poods (96 tons), against 1,591 poods (25 tons) in the first half of the preceding year and 2,405 poods (38 tons) in the second half of the same year. The decreased output of sulphate of ammonia should serve as an impulse to the extension of the production of sal ammoniac spirit, for ammoniacal water is necessarily produced in recuperative coking furnaces, and the extent of the production depends on the demand not only for ammoniacal spirit, but on that for pitch, benzol and the other byproducts of coking.

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The Story of Thomas Wardell's Success in Missouri

The discovery of coal in the Bevier district of Missouri was made by a well digger named Alex Rector. Rector took the contract to sink a well for Wilburn Hughes on a farm near the then obscure village of Bevier, now the largest coal town in Missouri. Rector was paid 45c. a day and board for digging his well. He thought he was doing uncommonly well, as farmhands were glad to get \$10 a month and a place to stay. At 14 ft. he struck coal—"black rock," he called it. A drill showed there was 6 ft. of this. He regarded it as an abomination, because it would ruin the water. He suggested digging a well in another place, and this time he was not bothered with coal.

The coal discovery didn't excite any particular interest. It gave Rector, who got a job to dig another well, no concern whatever. There was plenty of wood in the forests, and locomotives and steamboats were fueling with cottonwood.

A Macon, Mo., paper printed a brief story of the well digger's find. By chance a copy of the little weekly got over into Illinois and fell into the hands of Thomas Wardell, a young Englishman but recently come to America. Wardell was at Kewanee, not waiting for something to turn up, but looking over the field to turn something up. His sole capital was youth, brain and muscle. The next train took him to Missouri. In a week he had satisfied himself of the vast extent of the coal lands and the quality of the product.

The farmers about Bevier gladly signed option contracts for anything between the surface of their holdings and China. All they reserved in the bond was a crust thick enough to raise a crop on. Their royalty was 1/4c. per bushel. They figured they couldn't possibly lose anything at that, as they burned wood and had no earthly use for coal.

When Wardell had spiked down enough options to insure the carrying out of heavy contracts, he presented himself to the president of the Hannibal & St. Joseph R.R. at St. Louis. He told what he had to offer and what he wanted for it.

The president looked at the young man and said:

"Want us to change all our engines so as to give you a job, eh?"

"That is the principal motive with me," Wardell answered. "But of course I knew when I came to you that you wouldn't do it unless I could prove that I could deliver all the coal you might need and that it would be cheaper."

"And you are prepared to show me that?" asked the official curiously.

"I am," replied the young Englishman.

He then produced his maps, showed the depth of the coal and where it lay. His prospect holes determined the character of the material beyond the shadow of doubt, and he brought with him specimens. Having finished the examination, the president was called to look after other business.

"Come around this afternoon," he said, "and I'll talk with you about this a little further. Where are you stopping?"

Wardell mentioned a cheap tavern near the levee.

"What?" exclaimed the railroad man. "You come down here to negotiate a \$50,000 deal and stop at a 50-cent-a-day house?"

"Exactly so," replied the young man. "I had barely enough money to make the trip."

"Then how on earth do you expect to handle such a big contract?"

"You sign it, and I'll handle it all right."

"You haven't a sign of security in case you fail?"

"I'll assign my coal options to you. You can't lose."

The lad's courageous, self-reliant demeanor won. A banker had agreed to back him as soon as he demonstrated he could sell the coal. He went home with a contract to furnish a certain number of tons of coal per month to the Hannibal & St. Joseph engines, and by the time the road was ready for it, Wardell had his tipple, engine house and loading chutes waiting.

The history of the wonderful coal development of Macon County is practically a biography of Thomas Wardell, the English lad who began operations without a dollar. He died in 1888, the controller of the greatest mining district in the West, and worth more than a million dollars. He established schools, fostered churches and built hundreds of comfortable homes for the miners. His son's home there, built since the great operator's death, comprises one of the finest residences and parks in northern Missouri.

Alex Rector, the discoverer of the coal, abandoned well digging and went to mining. He became an expert miner and could easily make from \$3.50 to \$4 a day. This made well digging look contemptible by comparison, and he never resumed his earlier occupation. Through all the years of Wardell's big dealings Rector plied his pick and shot down his coal, but he never felt the call to control. He was a good miner and a good man. Rector died awhile back, full of years and worth about as much as when his pick struck coal and spoiled his well.

"If it was to do over again," he remarked a few years before his death, "I expect I would act just the same. Responsibility always fretted me."—*Kansas City Star*.

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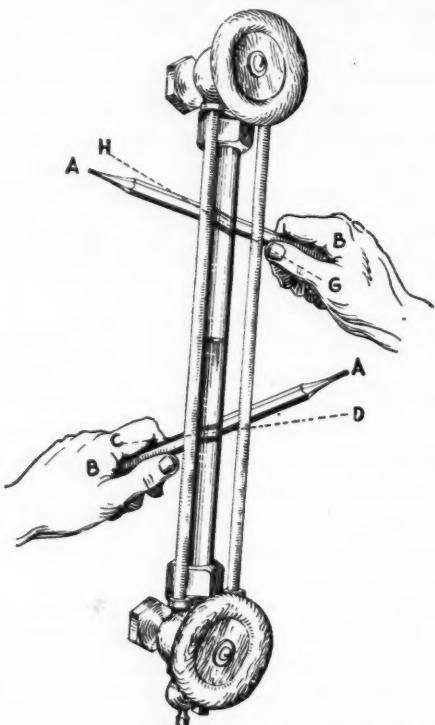
Slag as a Road Base

An article appearing recently in *Engineering News* called attention to the use of slag as a base for brick roads in portions of Pennsylvania adjacent to the steel plants.

This suggests an economical source of base for roads near smelters and coke plants. Where granulation is employed, the slag could be used for the subgrade and also in the concrete surface. Where the slag is delivered to waste in a molten condition it can be broken up when needed and used similarly to broken stone for macadam roads.

Is the Gage Full or Empty?

A handy way to determine whether a gage-glass is full or empty is to hold a bright-colored lead pencil behind the glass between the eye and the light. If the glass is full, that portion of the pencil back of the glass will appear to take the position *CD* shown in the illustration, and if the glass is empty it will appear as *HG*.



DEFLECTION OF VISION THROUGH A LIQUID

In other words, the center line will fall below the pencil point or the line *AB* if full and above the point if empty. The amount of the deflection depends upon the condition of the glass as to oil, etc., and upon the character of the liquid in the glass. By holding a white paper back of the pencil the deflection is brought out more clearly.—G. A. Robertson in *Power*.

XX

Recollections of a Manager

At the first meeting of our board of directors called after my election as manager, I locked horns with the president. It seemed that he had been in doubt as to the advisability of my appointment because he was of the opinion that my sympathies were too easily aroused by grievance committees and other spokesmen of the employees, and now that he had the opportunity it looked as if he proposed to show the directors that his fears were well founded. He might have succeeded but for the fact that he threw me into confusion with his first question and I began to feel that I was fighting with my back to the wall; after that I threw caution to the winds and easily carried the day.

The majority of our directors, and our president also, must be classed as successful executives of broad experience, but they have been out of direct personal contact with actual laborers so long that they seem to have forgotten that the laborer really has a viewpoint of his own. One of the directors remarked after the meeting was over that I spoke like a man from another world.

I recalled for their benefit several innovations that Mr. Scott, my predecessor, had attempted, with their approval, only to find that they could not possibly be carried out because of the opposition of the men; that, too, in spite of the fact that these plans were designed primarily for the sole benefit of the very employees who refused to have anything to do with them. I suggested to the directors that they were in the predicament of the father who surprised his nine-year old son with a beautifully engraved Golden Rule motto card as a reward for an unexpected display of conscience, only to be surprised in turn by seeing his son throw it in the waste basket. No wonder it appeared to them as if the workers did not know their own minds.

At that point one of the directors wanted to know what my attitude was toward the labor-union movement, and I told him frankly that I was quite at sea. But the mention of labor unions reminded me of the pitiful tale told to my wife by the wife of a union organizer, and I could not resist repeating it to the directors just to show them what unionism may mean to some of the supposedly favored ones.

Since union organizers spend most of their time in unorganized camps trying to organize them, very often for months at a time they have to keep their whereabouts a secret and at times even their families do not know where they are. Then there is always the uncertainty as to how their efforts will be rewarded, and the possibility of being run out of town by a crowd of bullies with a plentiful supply of tar and feathers. While all of this is going on, the organizer is furnished with plenty of excitement to keep his mind occupied and make the time pass quickly, but his wife and family have little else to occupy their minds than fears and misgivings, and their weeks seem like months.

The poor woman who came to our camp last winter in search of her husband had not heard from him in over four months and, finally, throwing caution to the winds, had decided to find him if such a thing were possible. In the last letter that she had received from her husband he mentioned our camp as his next stopping place and so naturally she came to our camp first. But after she arrived in our midst and failed to get word of him, she realized that he had not mentioned a state in his letter and then she learned that there were several towns of the same name in as many states, all of them mining villages. Mrs. Thompson heard of her plight and insisted on her coming to our house until she could get in touch with some of her husband's employees at union headquarters. She remained with us two weeks, and only got in touch with her husband the day before she left.

XX

The \$10 Prize Contest

Several weeks ago *Coal Age* offered \$10 for the best suggestion concerning the improvement of the paper itself, and \$10 for the most valuable suggestion as to how to improve the coal industry. More than 100 replies have been received in answer to this invitation, and consideration is now being given to the merits of the different answers. We expect to announce next week, or at latest the week following, the names of the winners of the contest. A number of the letters will be published.

How To Lubricate Wire Rope

Total lack of proper lubrication or the use of any so-called lubricating material in the mistaken idea that any kind of lubricant will answer for wire ropes is often the reason why they fail to give the length of service which is rightly to be expected of them.

In selecting a wire-rope lubricant the same careful study of the needs of the lubricated body and the suitability of the lubricant must be made as is needed when providing for the oiling of machinery. Many ropes fail because the inside wire becomes completely corroded before the outside wires have shown any signs of deterioration.

A rope in use is continually subjected, not only to the wear of the drums, sheaves or rollers, but also to a constant wear and friction on the inside, due to the wires in the strands moving slightly when the rope is bent, and this movement, if not lubricated efficiently, eventually causes the wires to fail.

To be of value the lubricant should not only penetrate to the hemp center and thoroughly saturate it, but it should also coat the inside wires thoroughly. A proper



Fig. 1

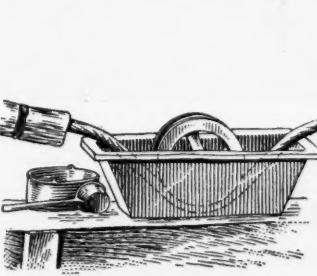


Fig. 2

TWO WAYS OF LUBRICATING A WIRE ROPE

lubricant, while doing this, will have sufficient consistency to cling to the rope and not drip off, leaving it practically dry a few days after the application is made.

The accompanying illustrations based on those in a Leschen & Sons pamphlet on wire rope show some of the simplest and best-known methods of applying a lubricant or protector to ropes while in motion. No great expense is necessary, as the equipment is of the simplest and can be procured anywhere. Of course these methods cannot be applied to ropes running at high speed, but where the ropes can be slowed down such methods are entirely satisfactory.

Fig. 1 shows a wooden trough of the simplest construction placed on the ground under the rope, which runs in the bottom of the V. Hot lubricant is poured on the rope and a bunch of waste or rags is held near the front in order to wipe off any excess and to avoid dripping. A sheepskin wiper, wool side down, should be used to remove the surplus from the outside of the rope and work the compound between the strands. It can be held in place by hand or bound around the rope with a piece of wire, as shown.

Where the ropes are accessible and can be slackened off enough to pass around the sheave, Fig. 2 shows the most efficient means of coating. The sheave is easily removed and is heavy enough to keep the rope immersed in the hot compound. Ropes can be coated in this manner at much higher speeds than are feasible when any other method is adopted, says the *Engineering and Mining Journal*.

Recent Legal Decisions

Two Points of Sales Law—There is no implied warranty of the quality or merchantableness of goods accepted by a buyer after being afforded full opportunity for inspection. Ordinarily, title passes to the buyer on his acceptance of delivery. (West Virginia Supreme Court of Appeals, *Showalter vs. Chambers*, 88 Southeastern Reporter, 1072.)

Duty to Mining Contractor's Employees—Under a contract to drive a heading and air course in a mine, the mine owner's liability for injuries sustained by the contractor or his employees is limited to the places where they are required to go in the performance of the contractor work, or places occupied by them with the owner's acquiescence. Hence there is no liability for injury resulting from the contractor's employee's unauthorized use of an air shaft, due to a defectively insulated cable. (Alabama Supreme Court, *Patterson vs. Alabama Fuel and Iron Co.*, 69 Southern Reporter, 952.)

Abrogation of Working Rules by Habitual Violation—Rules adopted by a coal company forbidding employees to use slopes, haulways, etc., in passing to and from work will be deemed to have been abrogated where it appears that they have been habitually disregarded to the knowledge and without objection of the operator. Nor can liability for injury to an employee resulting from negligence attributable to the employer be avoided through an established rule to the effect that miners riding upon inclines, cars, etc., shall assume the risk of injury, the operator permitting employees to use such means of conveyance. (West Virginia Supreme Court of Appeals, *Petry vs. Cabin Creek Consolidated Coal Co.*, 88 Southeastern Reporter, 105.)

In Lighter Vein

"No, Mister, Too Much Water"

Captain W. A. May, president of the Pennsylvania Coal Co., relates the following incident, which occurred on Aug. 26 at the annual first-aid contest of the Hillside Coal and Iron Co., held at Valley View Park:

The Pennsylvania Coal Co. has a pond not far from No. 5 shaft of No. 6 colliery. This pond is the center of what is a little park being beautified and kept in order under the supervision of Father O'Donnell, the parish priest at Inkerman, with the help of the company. The boys and girls bathe in this pond and strangers passing by on the public road sometimes indulge. One day not long ago two men went into the pond and one of them got into deep water and, when taken out by two boys, was unconscious.

The boys tried to restore him but were not skilled in first-aid work. The cries and lamentations brought Henry T. McMillan, our mine inspector; John Brown, superintendent of No. 6 colliery, and William Coplan, clerk at the colliery, to the scene. These men had received first-aid instruction and the first thing they did was to have two men lie face downward on the ground and then they placed the unconscious man across their backs, face downward. They at once went to work and relieved the man of the water that had filled him, and in 40 min., by performing artificial respiration, restored him to consciousness. The man, who was a Pole, was walking away when the superintendent said to him: "John, what was the matter—too much beer?" He replied, "No, mister, too much water."

■

A Deep Mine Shaft

Three Western engineers were discussing deep mine shafts, and two of them had told in glowing terms about mines in which they had worked.

"You fellows never saw a mine shaft," said the third. "Jump into my car and I'll take you to a regular mine."

They were soon at the mouth of the shaft. The hoisting engine was revolving at a tremendously high rate of speed, and to their horror they saw that the engineer was sound asleep in his chair. Both men rushed to the sleeping man, crying, "Wake up, man! You'll pull the cage through the roof!"

"What day is this?" the engineman asked sleepily.

"It's Tuesday, but stop her, quick!"

"Aw, g'wan," he replied, disgustedly, settling himself back in his chair. "She won't be up till Friday."—Harlan A. Russell in *Power*.

Snap-Shots in Coal Mining



COAL AGE

UNDERGROUND VIEW IN MINE NO. 48 OF CENTRAL COAL AND COKE CO., NEAR GIRARD, KAN.



BLAST FIRED IN STRIPPING OPERATION OF CORBIN COAL AND COKE CO., CORBIN, B. C.
The overburden was 30 ft. thick. Eight coyote holes were charged with 550 tins of black powder and 1 case of
40-per cent. dynamite. All holes were fired simultaneously by battery

The Labor Situation

General Labor Review

The anthracite region as a whole is now quiet, and it is likely that button strikes will be less popular than in the past. In one mine the union workers lost \$500 in wages in the effort to convert each of the wanderers from the union fold and yet these same wanderers still remained unregenerate. A few scattering strikes trouble the region, and in the north the Industrial Workers of the World—the "I Won't Works" as they are termed—are trying conclusions with the union, the sheriffs, their deputies and the State Constabulary.

The Somerset County strike in southern Pennsylvania seems likely to end. The union is said to be dilatory in paying strike wages, the miners are tired of the fight, and the drastic injunction of Judge Ruppel prevents intimidation and perhaps also some methods of persuasion that are not unlawful.

The union is showing its moral strength in Ohio by its suspension of two more unions which have been striking in violation of contracts and union orders. In Illinois the mine workers on strike have gone back to work by order of the union and are awaiting an investigation of their grievance. It seems as if the violence and aggression of the union were traveling East. Formerly it was the West and Middle West that were radical. Now, longer experience with the union and a clearer knowledge of economics and of the attainable has sobered both the Western regions and only the East, where the union was slower in getting a firm hold, is the home of radicalism. All of which is a sign that unionism like every other "ism" soon becomes conservatism as soon as the severity of resistant pressure is removed.

In Arkansas 300 mine workers of the Central Coal and Coke Co. returned to work Aug. 24, after the company had agreed to waive the application of the rule under which they would have been fined for having violated their contract by going on strike. Thus are the defences of the operator deliberately set at naught.

In the Southwest the conference over the new agreement still continues, the only point of difference between the representatives of the miners and the operators being in regard to the right of the miner who has been refused work to be told why he is rejected. The old contract gave him a right to demand the reason for his discharge, but did not give him any redress when he was a rejected applicant for employment. The operators refuse to make any change in the contract. Fifty per cent. of the Kansas mines are closed by strikes, owing to discontent over the delay in procuring an agreement.

Texas takes no part in the making of the Southwestern interstate agreement, and has thus been independent of Kansas, Missouri, Arkansas and Oklahoma for some years. It usually follows the lead of the operators and mine workers in those states, but this year the operators are determined to keep wages unchanged, however greatly the working conditions may have to be modified. As a result, the miners all struck on Aug. 31, when the old contract expired.

X

Seven-Hour Workday Is Sought

President White is quoted as saying on Sept. 4:

The affairs of the United Mine Workers of America are in excellent shape. All of our agreements have been rounded into form, there are no strikes on, the internal affairs of the union are in the best of condition and we are stronger, numerically, than ever before in our history.

We are now looking forward to some new ideals. We have nearly two years of industrial peace ahead of us and at the opening of the new year will start an educational campaign for a further reduction in working hours, a plan which has found favor among all of our members and among quite a number of the leading operators, principally those of Illinois.

Machine mining has made such inroads in the production of coal that we must recognize the machine as a great factor in the industry from now on. During the past year 242,000,000 tons of coal were taken out of the mines by the aid of machines and fully 95 per cent. of the coal mined in Ohio and in the Pittsburgh district was machine mined. By the use of the machines the production per miner is greatly increased and we hold that he should share to a certain extent in the benefit. We must also take into consideration the fact that the increased production threatens to reduce the number of men who will be employed.

It is safe to assume that during the next two years a campaign will be waged energetically for a shorter workday. We have already attained the 8-hr. day and the mine-run system, and we look forward with confidence to a further reduction in working hours, probably resulting in a 7-hr. day on the present basis or an 8-hr. day from bank to bank.

I found on my visit to the West, as in the East, a wholesome feeling toward this economic feature. In fact it is essential to the moral welfare of the hundreds of thousands of men who come under our jurisdiction.

X

Still Some Anthracite Unrest

The ending of the button strike in Northumberland County leaves the anthracite region working with normal regularity. The mine workers claim a complete victory. As a matter of fact, despite their declaration, they lost their 11 days of work and did not materially increase the number of union adherents.

At a meeting of the Anthracite Conciliation Board, on Aug. 29, W. J. Richards, president of the Philadelphia & Reading Coal and Iron Co., protested against these unnecessary strikes. He said that within a few weeks the mine workers had lost more than \$200,000 in wages, of which about \$93,000 was lost by his company's employees and \$120,000 by those of the Susquehanna Coal Co. In one instance more than \$27,000 was lost in trying to get 52 men back into the union. Even then the effort resulted in failure.

But the Susquehanna employees at the Scott colliery seem entirely indifferent as to whether they work or not; for they have started another strike. It seems strange that men like the mine workers, who we are seriously told can barely make a living, will strike at the dropping of a hat. The companies in the anthracite region used to pay at noon, the paymaster being sent to the mine for that purpose, but now they pay when the short 8-hr. day is over. At the Scott colliery of the Susquehanna Coal Co., at Shamokin, Penn., the breaker boys, despite the just settled 11-day strike, laid idle to compel noonday payments.

At No. 10 colliery of the Lehigh Coal and Navigation Co., near Tamaqua, Penn., the miners went back to work on Aug. 28 after a strike that had lasted since Aug. 24. They worked one day and came out on strike, demanding more pay for timber work. As far as can be ascertained, the company decided to meet the strike by shutting down the mine till the timbering was completed. Thus the miners who did the work could not complain that they could make more at contract mining; for until the timbering was done there would be no mining by contract. It has been the custom at these collieries and in all others to call contract miners out to do necessary repair work. But this involves less pay and a full day's work, and the miner is apt to rebel if the work lasts longer than one day.

On Aug. 25, at the Pyne colliery, near Taylor, the mine workers went on strike to compel the reinstatement of three men who had gone on an outing on Wednesday, Aug. 23, and had been discharged when they appeared at the mine the next day. About 900 men and boys are idle. The strikers claim that men who were unable to work because of sickness were suspended by the officials.

George Buss, sheriff of Luzerne County, and B. S. Phillips, of Lackawanna County, their deputies and the State Constabulary, have been placing the ringleaders of the Industrial Workers of the World at Laflin and Old Forge under arrest. The latter have kept 5,000 mine workers idle a week at Old Forge, Avoca and Duryea. It was found that the men were well armed with pistols and blackjacks, and it appeared that they were prepared to do violence to the United Mine Workers and others who might desire to work in spite of their mandates.

Fearing outbreaks in Lackawanna County, the sheriff obtained a court order closing the 53 saloons in Old Forge borough at midnight on Labor Day and all the following day. The order applied to dance halls over bar-rooms and to rooms attached to saloon buildings which the 3,000 striking Industrial Workers of the World use for meeting purposes. The Pennsylvania and Jermyn coal companies convinced the sheriff that there was grave danger that when still drunk from the holiday jubilation the men would interfere with and intimidate the mine workers as they went to work.

Somerset Operators Winning

During the last week the labor situation in Somerset County has improved considerably from the standpoint of those who would prefer to see the union worsted. There is much less union activity around Holsopple, in the northern end of the county, and J. Blair Kennerly is preparing to start up his Pretoria mine on a nonunion basis. It has been on strike for a month past, but will probably reopen some time in the coming week.

At Hooversville, the permanent injunction restraining the strikers from interfering with or intimidating the workers has quieted conditions, and the Knickerbocker Smokeless Coal Co. has increased its output about 100 tons per day. The Baker-Whiteley Coal Co. has also increased its activity.

The Stauffer-Quemahoning Coal Co., at Listie, is also gaining ground. At Berlin, the striking miners are dissatisfied because the district organization has failed to pay strike benefits. At Meyersdale, a number of American miners who recently joined the union and quit work are now repenting of their action. The mine of J. O. Ream and that of the Hocking Coal Co., and one of the Consolidation Coal Co.'s mines, are still idle, but will probably be able to resume shortly. Altogether, the United Mine Workers seem to be losing strength all over the county.

■

Ohio and Illinois Strikes

The United Mine Workers of America has expelled two more local unions, composed of men employed by the New York Coal Co. The members of these unions struck without permission and refused to return to work when instructed. Altogether 600 mine workers have been expelled from the union as a disciplinary measure. The miners at the New York Coal Co.'s No. 36 mine near Bechtel, following the drastic action of the union leaders, voted to return to work. All the trouble arose over the company's refusal to discharge a foreman whom the miners did not like. Later reports are to the effect that all the striking miners of the company at its four operations near Athens, Ohio, have returned to work pending a settlement of the differences. The president of the company, E. M. Poston, refused to consider a settlement until the men returned to work. James H. Pritchard, deputy mine inspector of the state, has been named by the company to negotiate a settlement, while the miners will be represented by John Moore, president of the state mine workers' organization.

At Duquoin, Ill., 500 men who were working at the Majestic mine went on strike when the owners refused to discharge a man who was alleged to have tampered with the scales. Frank Hefferly, vice-president of the organization, addressed the miners on Aug. 25 and induced them to go back to work, promising that if the employee was found guilty his discharge would be demanded.

■

Western Kentucky Troubles

The Daviess County coal field in western Kentucky is the scene of a strike of mine workers who are demanding increased wages. Daviess County, which has Owensboro for its chief city, lies along the Ohio River. The miners declare that coal has been retailed in Owensboro at 7 and 8c. a bushel and that an increase in wages is justified.

The Central Coal and Iron Co., at Central City, Muhlenberg County, in western Kentucky, recently lost a mine tipple by fire. At that time the mine was working on the old scale. The owners had agreed to sign the new agreement when the union signed one with the other operators. The union ultimately came to an agreement by which wages were retained unchanged and the working conditions were slightly altered. Just at that moment the Central Coal and Iron Co.'s tipple burned down—whether fired by some miscreant or by misfortune was never ascertained.

Shelby Gish, the vice-president and manager of the company, has declared that he will not rebuild the tipple unless the miners agree to work for 10 per cent. below the contract rate. The feeling against Gish's men is quite bitter because they worked when the miners in other mines refrained and because, it was alleged, they voted against a settlement, trusting in their arrangement with the Central Coal and Iron Co. to keep them busy until a new contract was obtained. This feeling will not be decreased by the 10 per cent. reduction proposed, which, if accepted, will make it harder still for the union men. The company has already lost a tipple and fearing other losses has mounted a machine gun on the premises.

At a meeting of the local union the miners agreed to accept the 10-per cent. reduction, but they met again and this time refused. The union is thinking seriously of expelling the local and is promising the men who refuse to return to work at the reduced wage that all care will be taken of them.

On the other hand, Mayor C. W. Wells, a former president of the district (No. 23), is said to have presided over a meeting of mine workers at which a new organization to be known as the Southern Association of Miners was proposed. It is even stated that the Central Coal and Iron Co. has offered to make with the new organization a better contract than the one which the United Mine Workers of America has just signed in district No. 23.

■

Wyoming Wage Agreement

The Wyoming wage agreement that was signed on Aug. 15 makes the following changes in the rules. It requires, Sec. 2 (a), that all agreements between the foreman and the pit committee shall be made in writing; Sec. 2 (f) that all money collected by the operator for dues, assessments, fines and initiations shall be turned over to the financial secretary of the local union, the recipient not being stated in the earlier contract; Sec. 2 (f) that the union may specify a percentage instead of a lump sum as the payment of each miner to the checkweighman if that method is preferred.

The measurement provision is as follows:

Measurement for which yardage is paid shall be made semi-monthly, except in case of resigned or discharged employees when same shall be paid as soon as possible, but not later than the day following such resignation or discharge, and payment in full shall be made for such work in the same manner other work is paid for.

The change in the wording relates to the payment of men who leave or are discharged.

In another clause the old contract provided that:

When a miner or loader has to leave his working place on account of water due to neglect of the companies, the companies shall, when practicable, give him another working place until such water is taken out of his place.

In the new contract the words "when practicable" disappear. The new agreement also provides that the "transportation of injured persons to the hospital shall be paid for by the company."

The contract also makes the following provision:

(1) The Hospital Commission can enter into contract with a doctor. (2) This contract with the doctor shall not be for a longer period than that covered by the duration of the general agreement nor extend beyond its expiration, nor shall it abrogate any part thereof. (3) When any new doctor is employed as per agreement he does not become an employee of the Hospital Association until the doctor and the Hospital Commission have agreed on the contract. (4) When any doctor's contract expires he automatically ceases to be an employee of the Hospital Association until a new contract is agreed upon by the Hospital Commission. (5) In making and renewing contracts with any doctor a majority vote of the Hospital Committee is required.

Sec. 6 of the General Provisions provides that:

When a mine or any part of a mine is closed down, throwing men out of employment, the men are to be employed in any other mine that may be in operation at that time by the same company and shall be given preference over new employees, they being taken on in rotation if they so desire when the mine again resumes operation.

The old provision was less contradictory but also less fair. It omitted "shall be given preference over new employees," which suggests as it should that the operator shall only give this work if he has it to give and would otherwise give it to men not formerly employed by him. This is evidently what is meant and it is a pity the first part of the provision does not say it.

In Sec. 7 the price of oil is reduced from 75c. to 60c. a gal. Perhaps this has something to do with the discovery of oil in Wyoming. It reverses the direction in which prices of oil have traveled in the last two years, though they have slumped a little lately. Sec. 10 in the old contract called for the legal amount of air at all working faces. This has been dropped, as the mining law fully covers this matter.

Sec. 22 in the new contract declares that:

No demands which are in conflict with the agreement shall be made locally by either operators or miners except as mutually agreed.

The provision in the former contract declared that no demands or interpretations of the contract shall increase the cost of coal except under abnormal conditions subsequently arising, and there shall be no provisions proposed violating the terms of the contract. Sections 26, 27 and 28 are also new.

The loading rate, including timbering and care of places (crossbarring excluded), will be 35c. instead of 34c. per short ton for coal 4 ft. 6 in. thick and over. Where the coal is under 4 ft. 6 in. thick the rate will be 39c. instead of 38c.

Washington Miners' Demands

The Washington miners' contract expired like that of the Wyoming miners on Aug. 31, and they are endeavoring to get a new contract with better working conditions and an increase of wage. The demand of the miners is printed below. It is no longer likely that it will be granted, for the contract will probably conform to that accepted in the state of Wyoming with which Washington has to compete.

But the miners' demands show such an admirable spirit that they deserve reprinting. Commenting on them, Martin J. Flyzik, president of the Washington district, says, "While we have not experienced an industrial revival in the Northwest of the same degree as that manifested along the Atlantic seaboard and in the Middle West, all indications point to an exceptionally good winter in the mining, lumber and ship-building industries along the Pacific Coast, and before the year is out we will experience the first labor shortage which this section has known for many years."

Washington Miners Submit Their Argument

To the Washington Coal Operators' Association:

Gentlemen—We herewith submit the demands of the mine workers of the State of Washington as represented in District No. 10, United Mine Workers of America, as the basis for the agreement between your organization and said District No. 10, United Mine Workers of America, the contract to commence Sept. 1, 1916, and to expire Aug. 31, 1918.

In presenting these demands which provide for certain increases in tonnage rates, day wages, yardage and dead work, we wish to point to the fact that during the past two years there has been a general tendency in industry throughout this country in the direction of the betterment of working conditions and increased wages. This has been particularly true in the coal-mining industry where wage agreements have expired this year and in the Middle West and Eastern coal-mining districts wage increases have been conceded amounting from 5½ per cent. to, in some instances, as high as 15 and 20 per cent.

In other lines of industry similar increases have been conceded in many instances by the voluntary action of the employers of labor, which, in our opinion, would go to prove that the general industrial conditions of the nation together with the increased cost of those commodities that the working people must of necessity buy, justify the position that we now assume in demanding the increases hereinafter provided for.

Largest Advance for the Lowest Paid Men

We demand 5 per cent. increase on all tonnage rates, day wages, yardage and dead work, and we recommend that in the application of this increase, consideration be given by the joint scale committee to those seven or eight classes of labor enumerated in the present joint agreement whose wages are below \$2.60; with a view to having the advance so applied that the wages of these classes of labor be raised at the expense of the higher paid classes of labor, so that they will at least conform to the standard of wages recognized generally as representing a living wage.

In addition to the foregoing basic increase we demand the following changes in the general provisions of the joint agreement in the interest of having the language of these joint provisions more explicit and less subject to double interpretation, and further, with a view to correcting some few inequalities and abuses that we feel in justice to all concerned should be remedied in the present joint conference.

MARTIN J. FLYZIK, President,
WILLIAM SHORT, Secretary.

Oil in the West Tends To Modify Conditions

The economic logic of the Washington demands might perhaps be attacked in the East where coal fuel is supreme. In the West competition with oil is an important factor. In the East where the effect of oil may be discounted, increased wages should not be granted or denied simply because times are prosperous or the reverse, but only when such an increase is needed to maintain the economic status of the mine worker in regard to other workers or to the cost of living. As other laborers are now getting better wages and as the cost of living is increasing the miner is entitled to the increases of wage he is getting and that would be true whether times were prosperous or the reverse.

When the wage rate is increased the cost of coal must and will be raised regardless of the market condition, for in a state like Washington where the profits of the coal business are small the increase in the selling price cannot but mirror the price of labor faithfully except where some other fuel like oil or gas threatens the life of the industry. What Wyoming, Montana and Colorado can afford to grant in increased wage Washington can also afford to give.

The interest shown in the wage of the man who receives less than \$2.60 per day reflects great credit on the mine worker and his leaders. It shows a self-sacrificing spirit on the part of the miner, the blacksmith, the carpenter and the tracklayer in favor of the man who may be said to have no trade.

On Aug. 22 the subscale committee, after a disagreement over the basic demand that provided for a 5-per cent. increase in wages, decided to adjourn sine die. This unfavorable result was reported to the reconvened convention of Sept. 7. The miners are remaining at work though their contract with the operators has expired.

Bache-Denman Coal Co. Wins

It will be remembered that threats, violence, rioting, arson and murder were all employed to prevent the operation of the Bache-Denman mines in Arkansas after the companies had decided to operate on a nonunion basis. As a result the companies brought suit against the United Mine Workers of America under the Sherman anti-trust law.

The companies asked for over \$1,250,000 and the Pennsylvania Mining Co. for \$600,000, this being treble damages for the loss sustained. The complaints in these suits set forth the attempts of the United Mine Workers to prevent the operation of open-shop mines in the States of Pennsylvania, West Virginia, Virginia and Colorado and alleged that these attacks were part of a general scheme to monopolize interstate trade for union coal and to prevent the operation of open-shop mines; that in furtherance of this scheme the defendants determined to destroy the competition of open-shop mines by preventing their operation. This was accomplished by the methods with which we are all familiar—strikes, threats, violence, mobbing, rioting and the actual destruction by fire of railroad cars and all facilities and structures essential to mining operations.

The cases of the Bache-Denman coal companies were dismissed in the United States District Court on the ground that the complainant did not set forth a valid cause of action under the Sherman anti-trust law. An appeal was thereupon taken to the United States Circuit Court of Appeals, and the cases were argued in St. Paul, Minn. The latter court reversed the court below and the following two questions were decided in favor of the plaintiff:

Suable Even Where There Is No Boycott

1. A labor union, though unincorporated, may be sued in its own name under the anti-trust law, Section 8 of which provides: "The word 'person' or 'persons' wherever used in this act shall be deemed to include corporations and associations existing under or authorized by the laws of either the United States, the laws of any of the territories, the laws of any state, or the laws of any foreign country."

Whether associations were suable under these provisions had never been decided. The defendants contended that "the United Mine Workers of America and the local unions not having been shown in this case to be organized under any particular law could not be held liable." In rejecting this contention the court said:

"Such a construction of the law would relieve labor organizations generally from all liability. . . . The defendants composing an organization of 400,000 miners, capable of doing great good or wrong, claim that they are not liable to be sued in the name of the association, but that the injured plaintiff may pursue the individual members who he can show were liable for the injury, leaving the powerful organization to go free. We do not think it can be said that the defendants, United Mine Workers of America, and the local unions, are not associations existing under or authorized by law within the meaning of Section 8 of the Sherman anti-trust law."

2. The next question was whether a case was stated under the anti-trust law as a combination in restraint of interstate trade and commerce when the defendants had not by boycott or otherwise interfered with the sales but have by attacks upon the productive facilities of the mine cut off the output which was sold into interstate commerce. . . . In this case the courts squarely held that any attempt on the part of labor unions to restrain interstate trade by interference with the production of articles for interstate trade constitutes a violation of the Federal anti-trust law.

This decision is supplemental to the Danbury Hatters' case, which the court twice cites and uses as a basis for its argument. The Danbury Hatters' case settled the principle that the Federal anti-trust law applies to all the tributaries of organized labor which seek to restrain or interfere with the distribution of products in interstate commerce, and that members of labor unions are liable for whatever is done by their union, through its officers within the delegated authority.

In deciding the Arkansas case, the United States Circuit Court of Appeals has held that labor organizations, which are frequently of large financial resources, may be sued and held responsible to the same extent as individuals and corporations. This case has also applied the law, for the first time, to a labor combination which did not involve a boycott, and only interferes with the productive facilities of factories or mines doing an interstate trade.

XX

Texas Coal Mines on Strike

The negotiations in Texas between the coal-mine workers and operators, which have lasted almost continuously for two months, have been so bitter that at midnight Thursday, Aug. 31, they resulted in the closing of the mines. Between 2,500 and 3,000 mine workers are now on strike. The men decided not to stay at work a minute after the old contract expired.

The operators were willing to give the men some improved working conditions, but refused a wage increase and some of the working conditions which the mine workers desired. The

mine workers' committee was headed by W. K. Gordon, of Thurber, and the operators' by Gus Sparling. The proposition of the operators was as follows:

We offer a renewal of the present working agreement, which provides the following scale of wages for pick mining: Mining rate per ton: At Thurber, \$1.32½; at Strawn, \$1.32½; at Lyra, \$1.40; at Bridgeport, \$1.56; at Newcastle, \$1.15.

And which carries a wage of \$3.13 per working day of 8 hr. for miners digging coal by the day, \$2.84 for underground daymen, etc., as fully set out in the scale of the present working agreement.

We are further willing to permit such changes in the working agreement relating to general working conditions as may be mutually agreed upon, provided such changes do not increase the cost of production and do not decrease the earning capacity of the miners.

We submit that the coal-mining industry of Texas cannot stand any increase in the cost of production of coal.

As you know, the principal demand for our coal has been and is from the Texas railroads. Some of these roads, including the Texas & Pacific east of Fort Worth, are now burning oil in preference to Texas-mined coal for the very evident reason that they consider it, notwithstanding the present high price of oil, a more economical fuel than Texas-mined coal, even on the basis of present prices and cost of production.

We further call your attention to the fact that many of the Texas roads are using, in preference to Texas coal, Oklahoma, Arkansas and Kansas coals, which come from fields which are unionized; also coal from the Alabama field, which, as is well known, is a nonunion district.

Compete with Rates as Low as 37½c. per Ton

In this connection we call your attention to the fact that the price per ton for pick mining in the Oklahoma field at most of the mines is only 78c., and furthermore that the prevailing price in the Arkansas and eastern Oklahoma field is 68c. per ton for pick mining, the above prices being on a run-of-mine basis.

The price per ton for mining in the nonunion field of Alabama, as is well known, runs as low as 37½c., and, as stated above, coal from this field comes into active competition with the Texas product.

As you well know, some of the smaller Texas union mines have already been practically put out of business by the competition above mentioned, and the others have been forced to sell their coal at actual cost to keep their mines running.

The mine owners, under these circumstances, are absolutely unable to grant an increase while continuing to sell coal at prevailing prices, and we feel sure that the consumer will not pay the increased price when he can get cheaper coal elsewhere or when he can use lignite, oil or gas in lieu of the coal mined by yourselves.

Hence the inevitable result of the increased demand must be a loss of market, a closing down of the remaining mines, a destruction of the Texas bituminous coal industry, a loss of work to your miners, all of which will lead to the miners and their families suffering many hardships.

Signed by representatives of the Texas & Pacific Coal Co., Strawn Coal Co., Bridgeport Coal Co., Wise County Coal Co., Belknap Coal Co.

On Aug. 30 the operators wrote an open letter to the union declaring that no attempt had been made by the latter to disprove the claim of the operators that the wage increase could not be paid in face of the competition of oil and gas fuel. They proposed:

(1) That work continue under the expiring contract at the scale of wages embodied in that agreement; that in accordance with the suggestion of the acting international president, Frank J. Hayes, the Texas miners hold a convention empowering the committee to negotiate a contract of this kind in accord with the market and economic conditions and that conferences be continued until a contract is agreed upon.

(2) That the conference continue and endeavor to make an agreement acceptable to both parties, the mines continuing to work under the terms of the expiring contract pending such further negotiations, the terms of the new agreement when one is made to be retroactive and effective as of date, Sept. 1.

The union leaders replied that they would continue negotiations, but that the mine workers would nevertheless strike on Aug. 31 as soon as the contract permitted and the men would remain on strike till the advances asked were granted. Should the wage demand be accepted the mine workers would undertake to return to work pending the completion of the contract.

■

A Simple Method of Timber Preservation

By L. B. REIFSNEIDER*

It is a well-known fact that climatic conditions in the tropics are deleterious to all classes of timber structures except those built of native hardwoods. In many places the latter cannot be procured or are obtainable only at prohibitive prices. Imported pine is most commonly used for all construction. In recent years nearly all the

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ordinary grades imported have been cut from timber that has previously been treated for the extraction of pine-tar products, and this class of timber has been found especially liable to decay.

TREATED TIMBER ON THE GROUND BEFORE USE

At very few places are treatment plants available, and a variety of methods of surface treatment have been tried with limited success. About three years ago the following method of treatment was inaugurated at a plant in Cuba, and it has been found to be successful. A tank of 3-in. plank, long enough to contain the longest pieces generally used in the mine structures and large enough to take 6 pieces of 10x10-in. timber, was constructed, and the seams were calked with oakum and tar to make the tank water-tight. A ½-in. pipe line for live steam was run from a shop boiler and connected to the center of the bottom of the tank to which a water line was also run for convenience in filling. The timber to be treated was placed in the tank and enough water run in to cover it, the timber being kept from floating by wedging it down under a removable tie-rod. The amount of water in the tank was then computed and chloride of zinc in the ratio of ½ lb. per gallon of water was dumped into the tank directly over the outlet of the steam line. Live steam was then turned on by opening the ½-in. valve, and the water was allowed to come to the boiling point. The solution was kept at that temperature for from 3½ to 4 hr., and the steam was then turned off and the solution allowed to cool for 7 to 8 hr. for each lot treated. When fresh timber was put in, the solution was strengthened by adding chloride at the rate of about ¼ lb. per gallon of solution to replace that absorbed by the previous treatment. It has been found that it rarely all dissolves at once, but is taken up slowly.

ZINC CHLORIDE IS NOT IRRITATING WHEN DRY

A small derrick and timber dogs are used to remove the timbers from the solution, as the latter, even when cool, is very irritating to the skin, although when dry there are no ill effects from handling the timber. All timber is framed and cut to length before being placed in the tank, so that no untreated surface is left exposed by framing later. Careful observation showed a penetration of the chloride in sapwood and fiber of ¼ to ½ in. and in heart from $\frac{1}{16}$ to $\frac{1}{8}$ in., and even after long exposure to torrential tropical rains, the fibers under the surface skin are found intact.

As a test, when the treatment was first started, several sticks of timber were cut and framed into sets for underground work and the parts of the same sticks were carefully marked. Half of the pieces were treated and the rest left untreated, and all were installed on 4-ft. centers in a drive where conditions in respect to moisture and ventilation were particularly bad.

Six months after this timber work had been set in place fungus and rot began to appear on the untreated sets, and at the end of 18 months all had been changed and found to be rotten almost throughout. The treated timber is still in place and apparently sound after 38 months, with no signs of fungus. On the surface the results have been equally satisfactory, and all new timber used in any permanent structure is treated after framing.

—Engineering and Mining Journal.

Editorials

Pacific Coal-Mining Institute

The proposal to organize a coal-mining institute in the State of Washington has met with the hearty approval of many mining men located in that field and the Canadian districts adjacent to it. Ever so many letters commending the movement and offering support have been received by the editor of *Coal Age*. A few of these letters have been published. There is one difficulty, however, in going ahead with the organization of such an institute and that is the unexpected opposition of several of the larger operators. We would not under any circumstances lend our aid to the formation of such a society unless the demand be unanimous. With this announcement, therefore, the agitation will be discontinued by us.

Briefly, here is the situation: *Coal Age* was informed some weeks ago that mining men in Washington were anxious to organize an institute or become members of the Rocky Mountain Coal-Mining Institute. The latter plan seemed impossible because of the distance the members would have to travel. Letters were sent to mining men by *Coal Age* and the replies were all favorable until the movement was well under way. Then a letter came from J. F. Menzies, saying that the operators would give the matter consideration at their next meeting. A few days ago we received a letter from D. C. Botting of the Washington Coal Operators' Association, stating that the operators could see no good reason or necessity for a coal-mining institute in the State of Washington.

On the other hand we are just in receipt of the following letter from James Bagley, State Inspector of Coal Mines:

I have talked with a number of those interested in coal mining in regard to the proposed institute and find that much interest is manifest among the officials at the mines. An organization such as you propose should be a success. Coal mining in the Northwest is confined to a small area and all that become members of the proposed institute would not have to travel any great distance to attend the meetings. You will have my support in this movement.

The proposed institute could start off with a good initial enrollment, for we have applications for charter membership from quite a number of mine officials, engineers and others interested in the coal industry of the Northwest. These men filled in some blank-form postal cards that were sent out with the idea of securing a popular and effective organization committee. The following names were selected by this postal-card vote: J. F. Menzies, C. C. Anderson, William Hann, D. C. Betting, E. S. Brooks, C. P. Jones, Charles Jones, C. R. Claghorn, N. D. Moore, Peter Bagley, J. J. Jones, George W. Evans. Many others were mentioned, but the above dozen was the popular choice.

With this statement on our part the matter is brought up to date, and we trust that although the movement is abandoned temporarily the plan will be carried through at some later and more propitious time. West Virginia and other states have a coal operators' association, but these operators encourage their mine officials to become

members of the local mining institute. There is an educational advantage that results from such meetings that should not be underestimated, and there is a social side that is both pleasing and profitable.

Coal Age wishes to thank all those mining men who have so promptly and so heartily offered their aid to the successful consummation of the movement. We trust that what has already been done will bear fruit at a later date, and that the coal fraternity in Washington and adjacent districts will benefit thereby.

⌘

American Federation of Labor

There is something inspiriting about the American Federation of Labor—all the workingmen getting together to help one another to improve their condition. Have we not been urging just that for the coal industry—this get-together spirit?

Somehow, the American Federation of Labor is not sailing smoothly, possibly because it does not have a clear-cut principle on which to work. As a matter of fact, every union in the Federation of Labor is seeking to raise the wages of its members, which wages the other members will have to pay.

That is not a feasible basis of federation. There is the good will and fellowship to bind the members together, but somehow reason refuses to accept a bond that is only one between adversaries. One union suddenly asks that the other unions shall pay it a 10, 15 or 25 per cent. increase and expects all the other unions to indorse its action, even to finance it in its struggle against the rest.

In all the realms of economic topsyturvydom is there anywhere a more ludicrous situation? "Give me help," says the carpenter, "to make you pay me more for building your cowshed." "Aid me," says the cabinet maker, "to charge you more for the work on your baby's cradle."

Federation is all right, but why not federate to prevent these unions from achieving the unbalancing of wages and the unsettling of prosperity? Why not federate on the basis that any union seeking a new scale with higher wages, shorter hours and better working conditions should prove its right to the change, as a nation should prove before an international tribunal its right and title to more land before being allowed to take it? Of course, the federation will not set itself against all change and would possibly be quite revolutionary as to the improved working conditions which it would advocate.

It is the federation of mining labor that has made the mine workers restrict their demands to almost the same amount all over the country—north, south, east and west. And the Federation of Labor may some time take a similar action and then perhaps there will be no more boosts in wages and a fairer condition for everyone throughout the United States.

And, you will say, with no more wage increases there will be no more hope of increased human comforts for those who work at manual labor. Not at all, the only hope for future progress is in the cheaper production

of goods—real goods that can be eaten, worn or lived in—not in cheaper money. Money may be made cheap as you please.

A penny an hour or a dollar a minute, who cares? It is what the penny or dollar will buy—how many hours or minutes of human labor, and how much that labor can produce in a minute or an hour. Those are the important matters. What is it to us how much silver there is in a dime or gold in an eagle? It is what we can do with it when it jingles in our jeans that really concerns us.

So after all, with unchanging wages and strikes only for real grievances, we shall come to have the main essential of happiness, peace. No body of workmen will be allowed to steal a march on us or compel us to strike to keep the ground we have won.

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Regulation of Coal Prices in the Middle West

The recent meetings of the Federal Trade Commission and the operators at Kansas City and Denver, to inaugurate a plan for solving the problems of the Western bituminous coal trade, have been productive of much favorable comment by those interested in the industry and have resulted in the initiation of a number of new ideas that were not considered seriously before.

Conditions at the Missouri, Kansas, Oklahoma and Colorado mines are almost identical so far as the trade situation is concerned, for the producing coal mines have been losing sales territory, have had their running time curtailed and have generally been doing an unprofitable business. Some of the Southwestern commercial mines have averaged less than 150 operating days per year, and the profit earned in the working time is more than absorbed during the idle time by maintenance expenses.

In addition, the mines in these states have been suffering from the demoralization in selling prices, not to mention the heavy inroads made on the coal markets by the increasing production of natural gas and oil. Mines in Colorado and Oklahoma during the past six or seven years have been obliged to make room in their natural territory for considerable competitive tonnage from New Mexico, and at the hearings about the only representatives who had no troubles to relate to the investigating commissioners were those from the latter state.

One prominent operator suggests that the only solution of the situation is for each district to establish a fair, uniform selling price that will yield a profit and then restrict production to the quantity of coal that can be sold on that basis. Sales animosities and price cutting have resulted from intra-district competition. People who are accustomed to use Oklahoma coal do not pay much attention to slight fluctuations in the price of Colorado, New Mexico or Kansas coal, but they do respond quickly to a reduction made by Oklahoma operators. The producers in each district may, by coöperative efforts, control prices instead of allowing them to be fixed by some erratic competitor or dictated by the trade, which naturally wants to buy as cheaply as it can.

The establishment of a stable intra-district price is necessary to avoid an open and uncontrolled price basis that must ultimately result in bankruptcy for everybody, or at least for all of the weaker operators. Each operator must understand that his problems are the same as

those of his competitor, that frankness and unselfish co-operation are important factors in developing confidence and that the loss of some business is by no means too great a penalty to pay for stability in price.

Price demoralization is generally due to two or three weak-kneed shippers of a district who are naturally pessimistic, and these unstable elements can usually be overcome by a determined effort on the part of the remainder of the operators in the field. Even if there is a demand in a certain field for 50 per cent. more coal than the output, the operators must take concerted action to sustain a higher level of prices or they will never be maintained.

The operations of the statistical bureaus established by the Franklin County, Ill., operators and subsequently adopted by the Williamson County field and other Illinois and Indiana districts, as well as by the southern Kansas mines, have accomplished excellent results. The southern Kansas field, especially, has so many operators large and small, that it has always been rather badly demoralized. Prices have fluctuated over a wide range and all were complaining that they were not making money and blaming some two or three of their competitors for holding down prices.

Under the bureau plan in effect, each operator reports to the statistical agent every day the number of cars and the price of each size sold, and the number of cars and the price of each size shipped. The sales territory is divided into certain zones, each operator is given a number, and daily tabulations are made showing the number of cars, sizes and prices. These tabulations are distributed to all the members of the bureau. The plan has developed some interesting information, and the officials of some of the companies who believed that their competitors were to blame for cut prices found that their own organizations had more low-priced contracts than their neighbors.

Those operators who started at the bottom of the list have been climbing to the top. Sales and shipments are now moving at nearly uniform figures, with the sequel of more friendship, good feeling and better understanding between the sales departments of the various companies than was ever known to exist before. School contracts, and other public competitive business, which have heretofore been the occasion of much price-cutting and hard feeling, have been awarded recently at what are fair living prices.

It is evident from statements made by Commissioner Hurley and the representations that have been made to the commission by the statistical bureaus of Illinois, Indiana and Kansas, that the commission is not going to frown upon such bureaus as long as they do not violate the law and endeavor to extort unreasonable prices from the public.

If nothing more comes of these meetings of the commission and the coal producers, it is at least a pleasing experience to hear an accredited representative of the Government admit that the coal industry is in the mire, needs to be systematized and made profitable and is willing to recommend such legislation as is necessary to aid in that direction. It is a function of government too often forgotten—this function of helping the producer. So often has it been overlooked in fact that we had begun to regard Federal officials rather as hinderers and meddlers than as friendly counsellors of the much-beset operator.

Department of Human Interest

Pennsylvania-Hillside Contest

The Capt. W. A. May loving cup offered to the team making the highest average for the first three events in the annual first-aid contest of the employees of the Pennsylvania Coal Co. and the Hillside Coal and Iron Co. was won by the team from No. 1 shaft of No. 1 colliery at Dunmore, with an average of 97½ per cent. at the eleventh annual contest held at Valley View Park, Inkerman, on Saturday, Aug. 26.

There were 19 other contestants. The collieries they represented and the percentages made were as follows: Law shaft, Central colliery, 98½; Butler colliery and No. 5 shaft, No. 5 colliery, 98½ each; No. 14 breaker, 97½; No. 2 shaft, Barnum colliery and Curtis slope, No. 9 colliery, 97 each; Consolidated breaker, 96½; Old Forge colliery, 96; No. 5 shaft, No. 3 colliery, 95½; Hoyt shaft and Leadville shaft, No. 1 colliery, 94½ each; Barnum breaker, 93; Underwood colliery and No. 1 shaft, Old Forge, 92½ each; Erie breaker, 91½; No. 2 shaft, Forest City colliery, 89½; No. 7 shaft, Ewen colliery, 86½; Central breaker, 86; Clifford shaft, Forest City, 85½.

The winning team was composed of Joseph B. Williams, John Thomas, Elmer Sawyer, John Mitchell, Frank Payarell and Ralph Almedo. The marks made in the three contests by the team were 98, 100 and 100.

The problems were:

Problem I—Covering the treatment of open wounds, burns, sprains and dislocations.

1. Wound 2 in. long across the back of the right hand.
2. Perpendicular wounds, one 2 in. long in front of and 1 in. from left ear, one same length behind right ear.
3. Large wound of right groin 10 in. long, half in groin and half in thigh.
4. Burns of left hand and arm to elbow.
5. Dislocation of left ankle.
6. Dislocation of right knee.
7. Sprain of right ankle.

Note—The wound of the hand is to be treated in every particular as you would treat it at the mine.

Problem II—(A) Covering treatment of severe bleeding from arteries.

1. Deep wound of right cheek.
2. Wound 1 in. above and on a line with front of right ear.
3. Wound behind and on level with middle of left ear.
4. Deep wound of right arm, 6 in. from shoulder.
5. Wound of both arteries, right forearm at middle.
6. Wound of palm of right hand.
7. Deep wound of right thigh, 6 in. from body.
8. Wound of both arteries of right leg.
9. Right foot cut off at instep.
10. Index and middle fingers of left hand cut off 1½ in. from hand.

(B) Covering treatment of severe bleeding from veins:

1. Wound of large vein at middle of left leg.
2. Wound of large vein 2 in. below left elbow.

Problem III—Covering treatment of fractures.

1. Compound fracture of right lower jaw.
2. Fracture of three ribs on the right side (suspected from nature of injury and catching pain on breathing).
3. Fracture of bone of upper arm at middle.
4. Compound fracture of both bones of left forearm at the middle.
5. Fracture of index finger of right hand.
6. Fracture of left thigh at the middle.
7. Fracture of both bones of left leg.

The fourth and fifth events were one-man contests of seven entrants each, the first for the men who had scored the highest averages in the preliminaries held in June and the second for the seven men scoring the next highest averages at the same time. The problem presented was:

1. Treat a compound fracture of the left lower jaw and severe injury to the right eye.
2. Dress a wound 8 in. long running from top of shoulder downward over shoulder blade, starting halfway between neck and summit to shoulder.
3. Treat a badly burned hand.
4. Apply tourniquet wherever possible to left arm and leg.

The winners in the fourth event and their collieries and ratings, with the prizes awarded, were:

1. Evan O. Evans, Forest City colliery, 99½, gold watch.
2. Max Melcher, No. 9 colliery, 98½, gold watch and chain.
3. John O'Malley, Erie colliery, 97½, gold cuff buttons.
4. William Newman, Underwood colliery, 96½, suit case.
5. Thomas O'Malley, No. 5 colliery, 94½, gold scarf pin.
6. Harry Odgen, Old Forge shaft, 93½, safety razor.
7. James Morris, No. 14 colliery, 91, silk umbrella.

The winners and prizes awarded in the fifth contest were:

1. John Mitchell, No. 1 shaft, 100, diamond pin.
2. James Pollard, Butler colliery, 99, traveling bag.

3. William Scott, Ewen colliery, 98, set of cuff buttons.
4. Robert Delaney, No. 6 colliery, 97, fishing rod and reel.
5. Arthur Groover, Barnum colliery, 96, safety razor.
6. Hugh Graham, Central colliery, 95, tie pin.
7. Samuel Van Luvander, Consolidated colliery, 94, pocket knife.

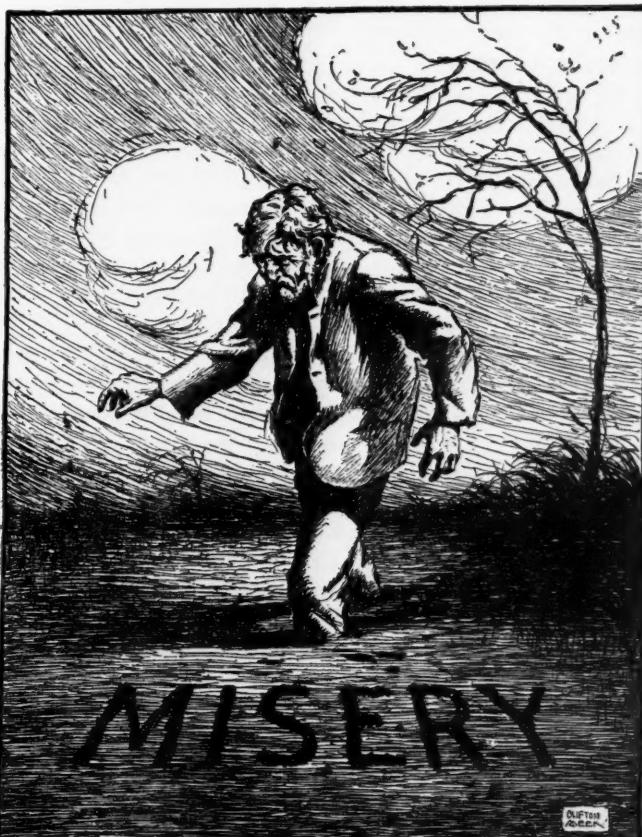
About 2,000 persons witnessed the contests which were followed by athletic games in the afternoon and dancing in the evening. The previous winners of the Capt. W. A. May cup have been:

Date	Team	Company
Nov. 24, 1906	Avoca	P. C. Co.
Oct. 12, 1907	North Pittston	P. C. Co.
Oct. 3, 1908	No. 14 breaker	P. C. Co.
Oct. 2, 1909	Avoca	P. C. Co.
Sept. 17, 1910	Forest City	H. C. & I. Co.
Sept. 2, 1911	Avoca	P. C. Co.
	(making the third time this cup was won by Avoca)	
Sept. 21, 1912	Avoca	P. C. Co.
Sept. 20, 1913	Fernwood	H. C. & I. Co.
Sept. 12, 1914	Ewen breaker	P. C. Co.
Aug. 28, 1915	North Pittston (No. 9 colliery)	P. C. Co.

The previous winners of the gold watch in the one-man contest for the past three years have been: 1913, Luther Heal, North Pittston district; 1914, Thomas Ross, North Pittston district; 1915, Clement Farrel, Mayfield district.

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The Dismal Swamp of Whisky



Courtesy of "New York American"

MANY A MAN KNOWS HOW WIDE AND DEEP IT IS
"Of all the earth's swamps, deserts and death places, none can compare in horror and misery with the whisky swamp—the darkest morass of sorrow, hopelessness and despair. Into that swamp millions have wandered, and in it millions have died. Nothing that Dante ever imagined could exceed in sorrowful misery the plight of those that are sinking in the whisky swamp. They would turn back; they cannot. They know it. They alone realize what their plight is, and what the power of the poisonous force that holds them."

Discussion by Readers

A Word to All

Practical discussion is one of the strongest features of a mining paper. The pages in this department of *Coal Age* are open to all and every practical mining man, from mine manager and superintendent down to the miner at the face, is invited to send us his comments and ideas in regard to any article in the paper or points of practical interest to which he believes attention should be drawn.

There are some things in reference to discussion, however, that should be observed in order to make a contribution of the greatest value. Statements of facts should be brief and to the point. The interest of the reader wanes when the writer uses more words than is necessary to clearly convey his idea. Repetition of points that have already been mentioned in previous letters is not necessary, except when it is desired to emphasize a point that one considers of great importance. In that case, the writer should refer to the previous statement, which makes his emphasis all the greater.

While brevity in the statement of facts is important, the narration of personal experiences and incidents of interest are more readable when given in plain conversational form *that* vividly illustrates the daily life and experience of the mine worker. Such illustrations always add to the value of a contribution, as they recall to the mind of the reader the actual surroundings and conditions and make clearer to him the viewpoint of the writer.

It is better to write shorter letters and send them often than to prolong a discussion to too great a length. Speaking of long letters, we have several such now on file—some of them 16 and 20 pages in length—that must wait their time for dissection. Such letters require careful reading to weed out unimportant matter and unnecessary duplication of points previously mentioned, both of which features are tiresome to the general reader.

Owing to the great interest that has been shown by *Coal Age* readers in the practical discussion of mining questions, it has become necessary to restrict the number of letters in the discussion of any one subject. Hereafter, as far as practicable, there will be a limit placed on the number of letters that will be published on a given subject, and this number will not be exceeded, unless exceptional interest in the subject should demand an extension.

We realize the fact that every subject gains in interest as its discussion proceeds, and for this reason many valuable letters are received after the discussion has been running for a time. We would suggest, however, that practical mining men of all classes—miners, timbermen, track-layers, drivers, stablemen, firebosses, mine foremen and assistant foremen, as well as superintendents and managers send us their individual viewpoints on a question as early as possible, making these brief and to the point. We pledge ourselves that the same will be given attention and run in as early an issue of *Coal Age* as practicable, with due regard to the prevailing interest in the various subjects running at the time.

The discussion of efficiency in mine foremen and firebosses has proved of great interest and value to these officials, as well as to the higher officers—superintendents and managers. It has broadened the viewpoints of all classes of mining men, in respect to the several duties and responsibilities involved and the relation that each class bears to the other. The result of these discussions will be greater mutual harmony and consideration of each other's interests, the need for which exists both in employer and employed. Both of the discussions have now been closed, 34 letters having been published in the former and 30 letters in the latter case. The discussion of what constitutes "An Efficient Coal Miner" now running will be limited to ten letters, as this subject presents fewer and less varied conditions.

It is hardly necessary to again remind our readers that all contributions must be signed by the writer and his correct address given. The name and address will not be published if the writer so requests and will be held in strict confidence. We urge, however, that, in most instances, the writer's name adds force to what is written, although there are occasions when a nom de plume, or pen name, is obviously preferred. J. T. B.

New York City.

Should Young Men Qualify?

Letter No. 1—I am led to ask this question after reading the editorial entitled "Timely Advice to Young Men," *Coal Age*, July 15, p. 115, in which the writer gives many good reasons why young men should not try to enter a staple industry, including that of coal mining. The reasons given for this advice are that staple industries, defined as being such as "render the public a real service," are destined to be conducted without profit, which is claimed to be the decree of the public. How near this is to the truth I will not attempt to say; but, without knowledge of the tendency of mining practice in other states, I will attempt to illustrate what appears to be the drift of such practice in Illinois.

Let me suppose that the John Doe Coal Co. has purchased and is starting to operate a mine that has been in existence a number of years and had a good record. Under the new administration many changes take place: First, comes the surface-efficiency man, who suggests and carries out radical changes in the system of accounting. This may be very proper, but it cannot be denied that, in effect, the sudden change from a long established system causes much trouble and worry for the officials all down the line to the last man underground.

Next, comes the safety inspector, and he recommends numerous alterations in respect to the system and methods in use throughout the mine. The methods he suggests are new and untried, and some of them meet with strong opposition on the part of the old men, who are well acquainted with the prevailing conditions, having worked in the mine from the time of its earliest development. Good practical mining men desiring to attain the high-

est efficiency and reduce the cost of operation are not wholly discouraged by the changes thus far, believing that for the most part they will work out all right in the end. But the worst is yet to come.

A new general manager is appointed whose methods of dealing with the underground staff in mines are notorious, and of whom it has been said that he moves his mine managers and superintendents about as a player does the pawns on a chess board. As a result, the present efficient mine manager (foreman) is suddenly replaced by a new man and given the choice of digging coal at the face or finding another job. He awakes to the fact that he must begin all over again, notwithstanding the many years spent in conscientious effort to do his duty in a manner that has fully acquainted him with every nook and corner in the mine. The trouble does not stop here. Numerous other changes are made and assistant foremen, firebosses and mulebosses alike are shifted. I can say that these facts are notorious in southern and central Illinois. One old and experienced miner in the district claims the record of having served under 37 different mine managers (foremen) and superintendents, while working at a single mine.

When one looks these facts squarely in the face, it is not a surprise to learn that young men are advised to qualify for other work than that of coal mining. I am inclined to say to young men, Go on the farm; start a store; do anything but coal mining; but if you still have a leaning toward your old dad's calling, seek a mine where the policy of the company is to treat its employees as it would itself be treated—where the mine officials earn and retain the respect and good wishes of the great body of their employees.

KANWATE.

West Frankfort, Ill.

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Merit vs. Favoritism in Gaining Promotion in Mining

Letter No. 4—It may often happen where a man has a determination to gain promotion by working his way to the top through a long line of positions, as was the case with "Canadian Reader," who has described his experience in *Letter No. 1, Coal Age*, July 22, p. 157, that fate will be against him, and he will find many stumbling blocks in the road. Some men, under these conditions, would leave the place at once. This man's experience as mining engineer is not an uncommon one, but the hardest fought battle is the one that has the most glory in the end.

All will agree that practical men are required about a mine to make it a successful proposition, and when an official higher up shows his preference for a favorite and promotes him to a position for which the man is not fitted, other men who are well qualified to fill the place are discouraged and often driven away. I would not be surprised if this was the case with the writer of *Letter No. 1*.

It is possible, however, that he, like many of us, did not realize that he already held a good position. It is human nature to be jealous of a fellow worker and many men who quit a company under these conditions will complain that the management has been unjust in its dealings with its men. Some men are always dissatisfied, and if they had the world, they would want the sun, moon and stars also. Some desire wealth, others power and

others knowledge, while a few crave all of these possessions for themselves. When a company promotes a man for social reasons or blood relationship or some similar reason ultimate failure is almost sure to result.

A few large coal companies have now adopted the policy of giving their employees the first chance of promotion to a higher position that becomes vacant or that is newly made. In order to make it more interesting, some companies give examinations for foremanship, superintendency and other positions. Recently, I received a letter replying to my application for a position as foreman with a large company. The general manager wrote me as follows: "I find your record to be good while formerly with this company, and I consider you fitted in every way to handle a mine, as you gave entire satisfaction when with us before. However, as you know, we are now promoting men to these positions from our own ranks and, for this reason, if you came to us you would have to take your turn with the rest."

Receiving this letter made me feel good, although I was refused the position I wanted. I felt it would be a fine thing to know that a fellow would not be held back by one who had a pull, but that a man working for promotion would be sure that his turn would come in time. In the same company the foremen have a chance to become superintendents. I could not help but think what a change this was from the former policy of the company when I was in their employ.

POOR JUDGMENT OF A SUPERINTENDENT

The experience of a man, as described in *Letter No. 2*, p. 158, should be a lesson to everyone. It teaches the necessity of studying one's employer closely and striving to gain his confidence. I recall an incident that will be of interest in this connection. It was a case of a good practical man who had risen to the position of mine foreman. He was not set up by his promotion and continued to associate with his men and to treat them with the same familiarity as before. He was a great favorite among the men, and everyone wanted to see him succeed. The result was that while he was foreman a great deal more interest was shown by the men in the work than ever before.

It seemed, however, that everyone liked the boss too well, for one morning he came to the mine downhearted, and it was soon known that "Jimmy" was to be replaced the first of the following month. The news was a surprise to all, but the only explanation given was that he was too familiar with the men, which could not be tolerated longer. So Jimmy went back to the face and it is safe to say that the superintendent was not troubled by his asking for another promotion. It was not long, however, before our old foreman was called to a neighboring mine, where he was made foreman and served with success long after his former superintendent was classed among the "undesirables."

This is a simple incident showing where right won over might. A man should not be discouraged by a single misfortune, but should strive to show his worth. I do not believe in jumping from one place to another without sufficient cause, but every man should have ambition to work for promotion and study to attain this end.

In closing, permit me to say it is a good plan for a company to give every man a chance to qualify for something better. When there is to be a vacancy, let it be

known that the place will be filled by the one showing the highest record and greatest fitness. This would have the tendency of holding men at the mine, since they would have to be an employee to stand a chance of getting one of the higher positions.

OSTEL BULLOCK.

Clothier, W. Va.

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Mining Thin Coal Seams

Letter No. 6—The recent letters on this subject recall some of my past experience in the mining of such coal, both in England and in this country.

For a number of years I was engaged in working a thin coal seam in a mine on the Bessemer & Lake Erie R.R., in Butler County, Penn. The experience thus gained has suggested to me thoughts and ideas that may be of benefit to those working under similar conditions. In this age of progress we are continually striving to meet old problems in new ways, and modern methods and systems of ventilation, haulage, drainage and coal cutting must be recognized and used in order to meet the demands for a maximum production of coal at a minimum cost.

The seam worked was known as the "C" or "Upper Kitanning" seam and varied from 2 ft. 6 in. to 3 ft. 10 in., with an average of 2 ft. 10 in., in thickness. This seam is underlaid with fireclay varying from 3 to 8 ft. in depth and overlaid with a slate roof varying from a few inches to 6 or 8 ft. thick. The coal comes well to the surface at the outcrop, and the maximum overburden or depth of cover rarely reaches 100 ft.

For over 30 years this seam has been worked by driving butt entries about 300 ft. apart. From 2 to 3 ft. of bottom was lifted on the roadways and loaded out of the mine. The entries were driven 8 or 10 ft. wide and rooms turned off both entries were driven a distance of 150 ft. to meet each other. They were turned on 36-ft. centers, the roomnecks being 6 or 8 ft. wide and 18 ft. long before being widened out to a width of 24 ft., which left 12 ft. for the width of the room pillars. The breakthroughs were 9 ft. wide and the air current was directed to the face by placing canvas or doors in the roomnecks.

In working this coal it was customary not only to lift bottom on the main roads as previously stated, but to do the same in the rooms, to provide headroom sufficient for a mule to enter. When driving the roomnecks, and until the room was widened out, this bottom had to all be loaded out of the mine. Later, the refuse was thrown into the gob. The men were paid \$2.35 per yd. for lifting bottom on the entries; 29c. per yd. for the same work in the rooms; and 56c. per yd. for driving crossecuts or breakthroughs. No bottom was taken up in the breakthroughs or the aircourses.

Now, when we consider modern methods adapted to the working of such a seam of coal, it is easy to see that a great saving in the cost of production can be effected in many ways. By the use of compressed air, or electric locomotives, mules could be dispensed with for hauling, which would practically eliminate the cost of lifting bottom on the roads and in the rooms, and would mean a saving on 1,200 ft. of entry of $1,200 \div 3 \times \$2.35 = \940 .

Again allowing 12 ft. at the face of each room where the bottom is not taken up, leaves 138 ft. of bottom lifted in each room, at a cost of $\$138 \div 3 \times 0.29 =$

\$13.34 for each room, and for the 66 rooms on each entry of a pair 1,200 ft. long, $13.34 \times 66 =$ say \$880. To this must be added the cost of hauling the bottom lifted on the roads and in the necks of 66 rooms, which I estimate would average 2.5c. per ton of coal mined. Or, for an output of 300 tons per day, $300 \times 0.025 = \$7.50$ per day.

The natural place for storing mine refuse is underground, and this can largely be accomplished by driving the entries about 14 ft. wide and building up the refuse material at the side of the road. This will not only eliminate possible damage to valuable surface property, but will do away with the unsightly dirt dumps that disfigure so many of our mining towns. Again, by the use of 16 or 20-lb. iron and steel ties in entries and rooms, greater headroom would be gained, which would permit of the use of larger cars and provide a greater output at reduced cost.

The operator is not the only loser under the present system of mining. For example, the miner lifts about 5 yd. of bottom at a cost of $5 \times 0.29 = \$1.45$, less 28c. for powder and fuse, making the net returns \$1.17 for 12 hours' work, or $1.17 \div 12 =$ say 10c. per hr., when he could be earning 25c. per hr. mining coal if he did not have to lift bottom. That is the hardest work the miner has to do in a mine, and I would suggest that ripping the roof would accomplish the same result at a less expense of time and labor. There is something very old and out of date in a mine where wooden rails are used in place of iron, both on entries and in the rooms.

Claytonia, Penn.

H. R. KIRKBRIDE.

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An Efficient Coal Miner

Letter No. 2—It seems to me that there might be a vast difference between the careful, obedient miner described by Jacob Riley, *Coal Age*, July 29, p. 196, and an efficient miner, meaning by that one who performs his work with the least labor and the greatest degree of safety and in a manner to give the largest returns both to himself and his employer.

For example, a careful miner would pay strict attention to all the rules and regulations laid down for the promotion of safety in the mine. He would stay in his working place during working hours and would not go prowling around the mine, visiting other places and exposing himself to danger on haulage roads. He would keep on hand in his place a sufficient supply of props and cap-pieces for use in case of special need when danger develops suddenly. Notwithstanding all this, the man may be a very inefficient miner.

There is a great difference in the way in which different men go about the accomplishment of the same task. The efficient workman plans his work beforehand and studies carefully how it may be accomplished with as few moves and as little exertion as possible, having due regard to safety. He has a systematic way of going about his work and is able to accomplish greater results than another man who may take twice the steps and make double the exertion, although it cannot be denied that the latter is an industrious and careful workman.

There are mines where the roads are covered with dirt and much time and labor must be spent in replacing cars on the track that have been derailed on this account. The time lost in this manner is often more than sufficient

to have put the road in good condition. In mines where the miner is compelled to handle his cars from the mouth of the room to the working face, I have frequently seen energetic, hard-working miners push their cars with difficulty over a dirty track, when it would have required less time and work to have kept the track clean. A little observation reveals many instances where good miners, who would make efficient workmen, lack the necessary judgment and system in performing their work. They have not given the matter sufficient thought.

In my opinion, the terms of employment and compensation have a great deal to do with the efficiency of the average miner. It is my belief that there is a vast difference in the number of cars a man will load and the quality of the coal loaded when payment is by the ton, as compared with the results obtained when payment is by the day.

A craftsman's son attending day school was probably a close observer of human nature. His teacher, with less practical insight, asked him the following question: "If a man does three-fifths of a piece of work in 10 days, how long will it take him to finish the job?" The boy scratched his head a moment, and then, with a wistful, earnest look, said, "Please, mum, is it a day job or is it contract work?"

In closing, allow me to define the efficient craftsman as a man who is fond of his work, energetic, careful, obedient, and one who uses his brains in applying system to the performance of his tasks.

H. L. HANDLEY.

Ruth, Nev.

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Safety in Blasting

Letter No. 2—Safety in blasting depends not only on the person performing the work but, also, on the efficiency of the foreman in charge, in the matter of enforcing the mining law and mine regulations in regard to blasting.

The bituminous mine law of Pennsylvania (1911) is very explicit in its provisions for safety in this regard. Art. 4, Sec. 9, directs the mine foreman to name the hours when blasting shall be performed in the mine and post the notice in a conspicuous place, informing the men of the time. Sec. 10 makes it the duty of the mine foreman to see that holes are "properly placed" and to "designate the angle and depth of holes, which shall not be drilled deeper than the undercutting, center-cutting, top-cutting or shearing." The foreman must also determine "the maximum quantity of explosives required for each hole" and give the necessary instructions in regard to the charging and tamping of holes.

Sec. 13 provides that "the mine foreman shall see that no person is employed to work in the mine until he has given satisfactory proof that he can do the work allotted to him without endangering the lives of his coemployees." Sec. 14 provides that "where explosive gas is being generated in quantities sufficient to be detected by an approved safety lamp . . . the mine foreman shall employ a sufficient number of competent persons who are able to speak the English language to act as shotfirers." The law further states that in such mines "no holes shall be fired by any person other than a shotfirer. They shall use none but incombustible material for tamping, which the mine foreman shall see is provided for them at convenient places inside the mine."

Art. 16, Sec. 2, provides that "In such portions of dry and dusty mines wherein explosive gas is being generated in quantities sufficient to be detected by an approved safety lamp, no explosives shall be used except permissible explosives, as designated by the testing station of the Federal Bureau of Mines. Each charge shall consist of only one kind of explosive." One of the requirements laid down by the Bureau of Mines, in regard to the use of permissible explosives, is that "The quantity used for a shot does not exceed 1½ lb., properly tamped with clay or other noncombustible stemming." (Miners' Circulars Nos. 2 and 6.)

It is thus seen that the bituminous law covers blasting in every detail and makes the duty of the person in charge so clear that it is impossible to misunderstand its meaning. My belief is that if mine foremen would enforce this law, there would be fewer accidents from blasting in the mine. Speaking of the responsibility of the foreman, it is a common occurrence for a miner who asks a foreman, "How much powder shall I use in that shot?" to receive the reply, "I don't know; ask the men working in the next place." The miner must then either get this information from other men or take a chance and guess at the amount of the charge necessary to break down the coal.

In his Letter No. 1, *Coal Age*, Aug. 19, p. 318, Frank A. Halverson says:

Despite the humane intentions of coal companies, the money spent for safety, the watchful vigilance of capable and trained mine officials, and the laws enacted to increase the safety of mining operations, disasters still continue to occur, and after each dread event is heard the question, "How did it happen; what was the cause?"

Let me ask, Is it not just possible that one of these same "watchful and trained officials" may have a guilty knowledge of just what caused the accident? In my opinion, the underlying cause, in most cases, is the neglect of mine foremen and assistant foremen to see that the mining law is enforced and that all blasting operations are made to conform to its requirements.

"Safety first" must be a misnomer as long as mine officials continue to take chances and permit violations of the law and the mine rules to go unpunished. Too often these matters are left entirely in the hands of the men, who must use their own judgment and often suffer the consequences because of a foreman's inefficiency.

It frequently happens that men are compelled to work under conditions that are unsafe for blasting, because the mine foreman is willing to take a chance on the possible occurrence of an accident, neglecting to make the necessary changes in the ventilation of the mine or to provide for the thorough inspection of the working places as required by law. Under these conditions one can hardly blame the miner for taking his share of the chances, although he is conscious of the risk he runs in so doing. The men have no power to secure better ventilation of their places or the removal of the accumulations of dust or the sprinkling of their places, which is necessary to make blasting safe.

Permit me to say that a grave responsibility rests on every mine official, who should practice what he preaches in regard to safety first and should not only be thoroughly acquainted with his duties as required by the law, but should be conscientious in their performance, knowing that the lives of the men in his charge are endangered by his neglect or inability to carry out in full the law's requirements.

Spangler, Penn.

E. E. F.

Organization in Rescue Work

Letter No. 1—I was deeply impressed when reading the article by R. Z. Virgin, entitled "Inspectors Need Rescue Chiefs," *Coal Age*, Aug. 12, p. 274. The condition described by Mr. Virgin seems almost incredible in any up-to-date mining camp.

If the great coal-producing state of West Virginia has not made provision in its mining laws for the maintenance at every mine, of suitable rescue appliances in the form of oxygen helmets or other types of breathing apparatus, it has been lacking in its duty both to coal operators and their employees, and I venture to say that it is high time that such a deficiency in the mining laws of the state should be corrected.

In this connection, permit me to quote the following extract from the Coal Mines Regulation Act of British Columbia, Chap. 160, sec. 106, which reads as follows:

106. There shall be established by the owner, agent or manager of every colliery such number of oxygen helmets or some form of mine-rescue apparatus as may be approved by the minister [of mines].

Such mine-rescue apparatus shall be constantly maintained in an efficient and workable condition, and shall in all cases be so stored or placed in or about the mine as to always be available for immediate use.

The lieutenant-governor in Council may, from time to time, establish mine-rescue stations for the purpose of supplementing, in case of need, the colliery installations of mine-rescue apparatus, and also for the purpose of training the holders of certificates of competency under this act in the use of such mine-rescue apparatus as may be approved by the minister; and it shall be incumbent on the owner, agent or manager of every operating mine to have all certificated officials who are physically fit, and not less than 3 per cent. of such number as the chief inspector may deem sufficient, of the workmen, trained in the use of such established mine-rescue apparatus.

Provided that in cases of emergency such stations shall be available for the use of any trained corps of mine-rescuers, duly qualified medical practitioners, or corps trained in the work of first aid to the injured, subject always to the order of an inspector.

The immediate effect of such a law on the statute books, accompanied with suitable provision for its enforcement, would be the equipment of every coal mine in the state with the necessary apparatus for engaging in rescue work in mines. This would be followed by the training of men who are physically able to undertake the work and the organization of first-aid and rescue corps in every mining camp. The work of rescue should engage the attention and co-operation of mine managers, superintendents, foremen, firebosses and all intelligent and reliable mine workers.

At the mines of this province, rescue work is thoroughly organized, and the equipment includes, besides the necessary breathing apparatus, oxygen tanks, safety lamps, etc., a full equipment of blankets, stretchers, splints of all kinds, bandages, portable electric lamps, pulmometers and the usual medical supplies for the treatment of men overcome with gas or burns. The organization is so complete that, should an explosion entomb every man on the morning shift, there would still be an efficient rescue corps available among the men who work on the afternoon or night shift. There would be no necessity of waiting for the arrival of the mine inspector or rescue corps from adjacent mines or districts.

That it should be necessary to delay the work of rescue in a mine where an explosion of gas or dust has entombed men, and that no effectual work of rescue can be undertaken until help arrives from a distance or until the mine inspector can reach the place, is unthinkable.

I do not approve of untrained men being allowed to put on breathing apparatus, which might only result in disaster to the wearer; but this should emphasize the need of trained men at every mine that is worthy of the name. It is unnecessary to add that judgment must be used in the selection of men for this work. They must be cool-headed and strong both mentally and physically, with good heart action and healthy lungs. The wearer of breathing apparatus must have a thorough knowledge of its construction and be trained in its use. All mine rescuers should be thoroughly acquainted with every part of the mine and understand its system of ventilation.

Breathing apparatus is not only useful for rescue work, but has been found indispensable, at times, in extinguishing mine fires where it was impossible to enter the section of the mine affected, owing to the place being filled with poisonous gases generated by the fire. It goes without saying that the equipment of a mine, with the necessary apparatus for such work and the training of competent men, who would be available in time of need, is a profitable investment. Also, such equipment and provision for possible needs show that the operator is truly interested in the safety-first movement.

W. H. MOORE, Underground Manager,
Vancouver-Nanaimo Coal Mining Co.
Nanaimo, B. C., Canada.

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Dumping Waste on the Surface

Letter No. 1—I was greatly interested in the dumping device described in *Coal Age*, July 29, p. 190, since we had a similar one in use here at our mine. The waste track extends from the coal tipple out over the railroad, where a good height is afforded for dumping the waste.

We found that the use of the "crab" referred to was a great improvement over the old method of dumping by hand and saved much time. However, it had one disadvantage, as it only permitted of the dumping of the waste between the rails and in line with the track. On this account, it was necessary to do some shoveling so as to widen the top of the dump to provide a foundation for moving the frame of the crab forward whenever the track had to be extended.

As everyone knows, the handling of the waste at some mines is a costly proposition, and it is important to unload the rock and return the car to the shaft as quickly as possible. To expedite this work, we devised a plan that is a decided improvement on the crab previously used. The top of the dump was first leveled off to 3 ft. below the track. Another track 6 ft. wide was then laid on this level and a truck built carrying a turntable. The truck was mounted on the lower track, which was shimmed up till the rails on the turntable were level with the waste track.

This arrangement enabled a car of rock to be run onto the turntable and swung around so that the contents could be dumped on either side or at the end of the track, as desired. The truck carrying the turntable is kept hooked to the main track, except when being run forward for the purpose of dumping a car. This plan enables the waste dump to be extended by dumping the rock in the direction desired and shifting the lower track. There is practically no shoveling of rock required, and it is possible for two men to handle 100 cars a day if necessary.

Allport, Penn.

S. D. HAINLEY.

Inquiries of General Interest

Bending Stress in Wire Rope

I was interested in the reply to the inquiry asking how the bending stress in a wire rope is calculated, *Coal Age*, Aug. 19, p. 319. Kindly permit me to draw attention to the difference in the results obtained in the calculation given there and the figures found in the tables of bending stresses for different wire ropes passing over sheaves of various diameters, in the catalog of a prominent wire-rope manufacturer.

In the tables to which I refer, the bending stress of a 1 1/4-in., 6-strand, 19-wire hoisting rope passing over a sheave 8 ft. in diameter is 2.72 tons per sq.in., as compared with 7.8 tons given in *Coal Age*, p. 319. The catalog states that the formula used in the calculation of the bending stresses of the tables is

$$S = E_r \frac{d}{D}$$

where E_r = modulus of elasticity of the whole rope (12,000,000 lb. for 6-strand rope); d = diameter of wire in rope (in.); D = diameter of sheave to center of rope or neutral axis (in.); S = stress due to bending (lb. per sq.in.). The difference is so great in these results that I shall appreciate being enlightened on the subject.

Philadelphia, Penn.

ENGINEER.

The chief difference in these results arises from the value taken for the modulus of elasticity, which our correspondent states is given in the catalog as 12,000,000 lb., expressing the value for the entire rope, instead of taking the generally accepted value of 29,000,000 lb. per sq.in. for steel. Allowing for sake of argument that the smaller value can be used in calculating the bending stress for a wire rope, this would reduce the result in this case $\frac{12}{29} \times 7.8 = 3.2$ tons, which would still be greater than the 2.72 tons, quoted by correspondent as given in the table.

It is hard to understand how the result, 2.72 tons, can be obtained by substituting the given values in the formula quoted by correspondent. For example, taking the diameter of wire in a 19-wire hoisting rope as $1/15$ of the diameter of the rope, which has been given as common American practice, makes the diameter of wire for a 1 1/4-in. rope, $1/15 \times 5/4 = 1/12$ in. Also, the diameter of bending or diameter of neutral axis, in this case, is $D = 8 \times 12 + 1/4 = 97.25$ in. Then, making $E_r = 12,000,000$, we have, for the bending stress deduced by the above formula,

$$S = \frac{12,000,000 \times \frac{1}{12}}{97.25 \times 2,000} = \text{say } 5.14 \text{ tons per sq.in.}$$

Then, multiplying this unit stress due to bending by the actual area of metal in the rope, which is the total area of the 114 wires, or $114 \times 0.7854(\frac{1}{12})^2 = 0.62$ sq.in., gives for the equivalent load due to bending $0.62 \times 5.14 = 3.2$ tons.

In regard to the relative accuracy of these two methods of calculating bending stress, we can but say that the bending stress in a single wire lying on the outer surface

of the bend must determine the bending stress for the entire rope, since the rupture of this wire determines the ultimate strength of the rope. Hence, it is correct to calculate the bending stress in the ultimate fiber of a single wire on the extreme radius of bending, using for this purpose the full value of the modulus of elasticity for steel ($E = 29,000,000$ lb. per sq.in.). This unit stress in the extreme fiber must then be multiplied by the actual area of metal in the rope, in order to find the equivalent load due to bending for the entire rope. Finally, this load due to bending must be subtracted from the permissible load of the rope to obtain the safe working load.

There may be a tendency on the part of some rope manufacturers to reduce the allowance for bending stress to its lowest possible limit so as to increase the "safe working load" of their ropes, which must, however, unduly shorten the life of the rope and is not recommended.

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Springs on Mine Locomotives

In our mine we are working three types of locomotives—one a 6-ton, General Electric; another a 6-ton, single-type, Goodman; and a third, a 7-ton, double-type, Goodman. These three machines are working under the same conditions, except that the single-type Goodman has no springs, while the other two machines are mounted on springs, as customary in mine locomotives.

We have observed that the 6-ton, single-type, Goodman will pull from 10 to 15 tons more coal than either of the other two machines, although it is a whole ton lighter than one of them. I claim that the reason for its greater tractive power lies in the fact that it is not mounted on springs as are the other two machines.

In the mine there are places where the haulage road has a 2 per cent. grade on either side of a depression in the seam. It is the custom of the motormen to make a run on the downgrade and through the swale, in order to make the upgrade on the other side. While the two motors mounted on springs stall on the upgrade in these places, the one without springs never stalls, though pulling a heavier load. Perhaps some readers of *Coal Age* can explain this seeming anomaly.

MOTORMAN.

Eldorado, Ill.

Coal Age will be glad to hear from others on this question. Mine locomotives are generally mounted on springs over the trucks, the former acting to hold the wheels in continuous contact with the rails, which should make such locomotives possess a greater tractive power under the same conditions of haul. However, in case the machines are operated on storage batteries, the difference in tractive power may be found to lie in the batteries and not in the machine itself. In discussing the question, let it be assumed that these locomotives are operated on the trolley system and that each thus takes its power from the same source and works under like conditions except for being mounted on springs.

Examination Questions

Mine Managers' Examination, Springfield, Ill., Mar. 6, 1916

(Selected Questions)

Ques.—How many tons of coal are there underlying a square field containing four acres, the seam being 4 ft. 4 in. thick and lying at an angle of 31 deg.; the specific gravity of the coal is 1.51?

Ans.—An acre contains 43,560 sq.ft. The cubic contents of this seam lying level under four acres of land would be $4(43,560 \times 4\frac{1}{3})$ = say 755,000 cu.ft. The weight of 1 cu.ft. of the coal is $62.5 \times 1.51 = 94.375$ lb. Therefore, for a level seam, the weight of coal under four acres would be $755,000 \times 94.375 \div 2,000$ = say 35,626 tons. But, for an inclination of 31 deg., this weight must be divided by the cosine of 31 deg., giving $35,626 \div 0.85717 = 41,562$ tons.

Ques.—Suppose you had to deliver 200,000 cu.ft. of air per min. from a fan, and, say 13 cu.ft. of air weighs 1 lb. What would be the energy of the discharged air if delivered into the atmosphere through a chimney 4x5 ft. and through a chimney 20 ft. square, respectively?

Ans.—It is difficult to understand the meaning of this question, if it has any meaning that is of practical value. The only intelligible answer that can be given is to calculate the weight of air discharged through the chimney 4x5 ft. in section, the height of which is not given; also do the same for a chimney 20 ft. square. Then, calculate the energy in the discharged air from its velocity in the usual manner.

For example, since the sectional area of the first chimney is $4 \times 5 = 20$ sq.ft., the velocity of the air passing out of the chimney will be $200,000 \div 20 = 10,000$ ft. per min. The area of a chimney 20 ft. square in section is $20 \times 20 = 400$ sq.ft., and the velocity of the discharged air, in that case, is $200,000 \div 400 = 500$ ft. per min. The weight of air discharged in either case is $200,000 \times 13 = 2,600,000$ lb. per min. Dividing this weight by the force of gravity gives, for the mass of air discharged per minute, $2,600,000 \div 32.16 = 80,840$ units of mass. The energy of this moving mass is found by multiplying it by the square of its velocity in feet per second, which gives for the energy of the air discharged from the 4x5-ft. chimney, $80,840 \left(\frac{10,000}{60}\right)^2$

$= 2,245,700,000$ ft.-lb. per min. Likewise, the energy in the air discharged from the chimney 20 ft. square is

$80,840 \left(\frac{500}{60}\right)^2 = 5,614,000$ ft.-lb. per min. The question is one of no practical value and should not have been asked in a mine managers' examination.

Ques.—When the mercury barometer stands at 30 in., how will one of glycerin stand?

Ans.—We have never heard of a glycerin barometer. However, at a temperature of 60 deg. F., the specific

gravity of mercury is 13.555, while that of glycerin at the same temperature is 1.255. For the same atmospheric pressure the height of a column of liquid supported thereby will vary inversely as the specific gravity of the liquid. In other words, the column ratio is equal to the inverse specific-gravity ratio. Hence, calling the height of glycerin column corresponding to 30 in. of mercury x , we have

$$\frac{x}{30} = \frac{13.555}{1.255} = 324 + \text{in. or } 27 \text{ ft.}$$

Ques.—In sinking a shaft, how many long tons of rock can four men raise with a windlass in 8 hr. from an average depth of 60 ft., the bucket being unbalanced and each man being able to do in the time 1,400 units of work in raising stone?

Ans.—This question cannot be answered for several reasons. The work performed by an average man in raising a weight by turning a crank is estimated at 2,700 ft.-lb. per min., while the question states that each man can only do 1,400 units of work in the time mentioned (8 hr.), which would be absurd. Again, in order to calculate the weight of rock raised per man in 8 hr., assuming the power of the man is given in foot-pounds per minute, it would still be necessary to know not only the weight of the bucket but its capacity.

For example, assuming that the bucket weighs 100 lb. and holds when full 400 lb. of rock, the effective work performed is $\frac{4}{5}$ of the power exerted, taking no account of friction. But, a certain allowance must always be made for changing and lowering the buckets each time, which will further reduce the effective work done in raising the rock. The question is not a fair question, therefore, to be given in examination.

However, assuming the work of an average man in this case to be 2,700 ft.-lb. per min., two men on the crank would perform 5,400 ft.-lb. of work per min. In raising a bucket weighing 100 lb. and containing 400 lb. of rock, or a total of 500 lb. through a height of 60 ft. the work performed is $500 \times 60 = 30,000$ ft.-lb. The time consumed in making this hoist is therefore $30,000 \div 5,400 = \text{say } 5\frac{1}{2}$ min. Then, allowing 1 min. for changing buckets at the top of the shaft, $\frac{1}{2}$ min. for lowering the bucket, and 1 min. for changing buckets below, gives a total of 8 min. for each complete hoist. In that case, the weight of rock hoisted by four men in 8 hr. would be $400 (8 \times 60) \div 8 = 24,000$ lb., or $24,000 \div 2,240 = 10.7$ long tons.

It is the custom of "Coal Age" to answer as many of the questions asked in the different state examinations as possible, within three or four weeks after the examination is held. The reason for the delay of six months in answering the Illinois questions is owing to the refusal of the present Illinois Mining Board to send us the questions after the examination is over. Illinois is the only state that has elected to assume an attitude that is manifestly unfair to her ambitious students of mining who are anxiously studying these questions to fit themselves for greater efficiency. The questions selected above are those that have given the most trouble.

Coal and Coke News

Washington D. C.

Adoption of the 8-hr. day as the basis of wage and labor on all interstate railroads is assured in legislation recently passed by Congress. While this controversy was waged around the question of the increases in wages, the railroads will doubtless find themselves confronted with an increased coal bill as it was predicted that one of the results of the law will be to increase the number of freight trains. The railroad managers are of the opinion that the new law will necessitate a reduction in the freight train load in order to make extra speed and this reduction in the train load means more engines on the roads.

According to the present basis in vogue on about 85 per cent. of the roads of the country the four brotherhoods are compensated on the basis of a 10-hr. day. During these 10 hr. the freight trains are expected to make 100 mi. or 10 mi. per hr. When the men presented their demands for the adoption of the 8-hr. day, they pointed out that it is possible for the roads to increase the speed to 12½ mi. per hr. and thereby permit the accomplishment of the same amount of work during the 8-hr. as has been accomplished heretofore in 10 hr.

The railroad managers said that they have studied this problem and found that if the train speed is to be increased from 10 to 12½ mi. it will be necessary to cut the length of the freight trains and to put more trains on the roads. The managers said that in congested districts this might prove impossible and that the railroads would therefore find it more economical to pay the extra wage bill and not increase the number of trains.

On the other hand members of Congress were hesitant about sanctioning the 8-hr. bill, as proposed by President Wilson, because of its possible moral effect upon labor engaged in other lines of industry. Some members were positive that the Federal 8-hr. law in any class of service is unconstitutional inasmuch as it interferes with the freedom of contract, nevertheless they dared not vote against the bill because of the alleged political power of the labor vote. The new 8-hr. law applies only to labor engaged in service on interstate railroads. It will take effect Jan. 1 next.

A Complaint Is Filed

A complaint against the rates on bituminous coal from the Hocking district in Ohio to points in northeastern Indiana and the southern peninsula of Michigan has been filed with the Interstate Commerce Commission by the Sunday Creek Coal Co. The Hocking Valley and other railroads were named defendants to the complaint. The Commission was not only requested to prescribe reasonable rates on this traffic for the future but was also asked to determine the just discriminatory differentials which should exist in the rates between the Hocking district in Ohio and the West Virginia mines to the destinations in question.

HARRISBURG, PENN.

That a state health insurance bill will be introduced in the next legislature is certain. The state Federation of Labor will prepare such a measure and urge its adoption as a bit of propaganda work.

In view of the fact that the compensation law is in need of serious amendment, it is not likely that department of labor officials will mix in the health insurance, the general opinion prevailing here is that the public should have more time to familiarize itself with the idea before definite action is taken.

The opinion of the medical profession on health insurance will be obtained by state officials, according to an announcement made at the conference of physicians representing the large industries of the state held at the capitol several weeks ago. A committee of eminent physicians and surgeons in Pennsylvania will be requested to prepare a report on the advantages or disadvantages of health insurance as viewed from the attitude of the medical profession.

One of the features of the compensation law that needs revision is the \$100 provision for medical attendance. The amounts allowed physicians for major and minor operations also fail to work out equitably in many instances, and under the provisions of the law it now frequently happens that the hospital is left high and dry, there being no funds available with which to meet its charges. The \$100 allowed for medical attendance has been the cause of considerable friction.

In the opinion of officials, the course to pursue will be to plug up the weak spots in the compensation legislation, rather than to attempt to

take on additional loads. It is known that a well-organized and energetic insurance company lobby will attempt to upset the state insurance end of the existing compensation scheme. The state insurance fund has been growing too fast to suit various companies, and it is said that money is being collected with which to finance an anti-state-fund campaign.

A Large but Unsatisfactory Award

The largest award in the history of the Workmen's Compensation Board was made on Aug. 31. It amounted to \$6,613.32 for the widow and four children of Anton Pokropski, who received injuries on July 10, which caused his death.

Despite this unusually large compensation for the death of her husband who was earning only \$20 a week, the widow, according to the referee, was not satisfied and declared it was not enough to support her. The money was apportioned as follows: \$3,600 to be paid within 300 weeks, at the rate of \$12 a week for the widow; youngest daughter, \$1,635.66; other daughters, \$591.61, \$389, \$297, respectively, according to age. In addition to this, \$100 was provided for funeral expenses.

Miners Must Be Safe During Blasting

Bituminous coal miners and laborers cannot needless be exposed to the dangers of blasting whether they be in a gaseous or non-gaseous mine according to an opinion rendered to the Department of Mines on Aug. 29, by Deputy Attorney General Collins.

Section 14 of Article LV of the act of June 9, 1911, says in part:

"In all mines in which coal is blasted from the solid, all holes shall be fired when all workmen are out of the mine except the shot-firers and other persons delegated by the mine foreman to safeguard property.

"No shot-firer or any other person shall fire a shot in any working place or in any mine if his safety lamp can detect explosive gas at the roof. In gaseous, dusty mines in which locked safety lamps are used, he shall fire no holes unless the entries and rooms which are dry and dusty are so thoroughly wetted as to prevent the existence of any dry dust for a distance of not less than 8 ft. from the hole to be fired: Provided, however, that in all mines wherein the coal is being blasted from the solid, the mine foreman shall direct and see that the provisions of this section are fully complied with."

The contention was raised by a number of operators and superintendents that this law applies only to gaseous mines, but the Attorney General's Department decides otherwise.

Compensation Record for Five Months

Dependents of 290 workers who lost their lives in accidents during the first five months of the year will receive compensation amounting to \$74,962, according to the secretary of the State Workmen's Compensation Board.

This amount to be paid in installments to dependents during the coming year, is for fatal accidents exclusively and does not include cost of medical attendance and compensation in non-fatal cases. It is estimated that when all compensation agreements are perfected the total payments will approximate \$1,500,000.

The average total compensation in each of the 290 cases is \$2,560.90. That the compensation benefits principally the men of modest wages is indicated by the data, which shows the average weekly wage of 862 men killed was \$14.68 or a total annual payroll of \$666,084.

The 862 fatalities left 547 widows, 1,109 fatherless children, 37 dependent parents and two dependent brothers and sisters. Three hundred and fifteen unmarried workers were killed. More than half of the total number of workers killed were Americans. The majority of the fatalities occurred in mines.

The division by occupations is: Miners, 375; laborers, 187; iron and steel workers, 157; railroad employees, 119; clerks, 7; firemen, 9; salesmen, 5; civil engineers, 1; policemen, 1; motormen, 1; teachers, 1; carpenters, 1.

The Division of Costs

The Workmen's Compensation Board has adopted the following rule in regards to costs: "The referee shall require each party to file with him four days after final hearing an itemized statement of the costs, incurred by the party for the hearing and furnish a copy of the same to each adverse party."

"The referee shall tax the costs incurred by the parties as shown by the itemized statement filed by them and shall place such costs as are allowed by him together with those incurred by the referee, upon the unsuccessful party, unless the special circumstances of the case shall, in his judgment, make it proper to otherwise dis-

pose of them. In such case he may put upon each party the costs incurred by him, or he may divide the costs in such proportion as he shall deem proper or he may put the costs upon the successful party and shall in his award set forth fully his reasons for so disposing of the costs.

The costs of the hearing shall be paid to the referee and shall be paid over by him to the parties entitled thereto, unless the party on whose behalf the costs have been incurred shall present receipts from the parties entitled thereto, in which case the costs so paid by the party shall be paid to him."

PENNSYLVANIA

Anthracite

Pottsville—Fire did considerable damage recently on the fifth level of the Oak Hill colliery at Duncott. The colliery officials were aided in their battle with the flames by M. J. Brennan, mine inspector for this district.

Drifton—For falsely representing himself to be a member of the miners' local and wearing the union button a miner was arrested and fined by a justice of the peace with the costs, with the understanding that he would affiliate himself with the union workers.

Hazleton—Taking advantage of a strike of the 800 employees of No. 10 mine at Coalport the Lehigh Coal and Navigation Co. has decided to keep the operation closed until it can be thoroughly re-timbered.

Dick & Co. has purchased the coal stripping interests of the J. H. Dugan in the Lehigh & Wilkes-Barre Coal Co.'s basin in the vicinity of Honey Pot.

The Spring Brook washer of the Lehigh Valley Coal Co. which has been idle for some time resumed operations on Sept. 1. The men who were employed there before the shutdown were transferred to other workings and have now been shifted back.

The Mining Institute of the Hazleton Y. M. C. A. is getting under way for the fall and winter season and the first meeting will be held Oct. 25. It has been decided to open the night schools on a more comprehensive plan this fall, and a faculty of trained teachers will be engaged to handle the classes in mining. H. M. Crankshaw has been elected president of the executive committee.

Wilkes-Barre—Workmen at the Hollenback No. 2 colliery of the Lehigh & Wilkes-Barre Coal Co. have dug out the body of Joseph Chazenski, aged 28, one of the six men killed in an explosion in No. 6 slope of the colliery on the afternoon of Mar. 9 last. Positive identification of the victim, who it is believed set off the gas, was made possible by the rip on one shoe and company officials are now certain that no mistake has been made in burying each of the six victims who were badly burned and crushed. Doubt existed for several months that Chazenski had been buried in a grave bearing another victim's name.

Nanticoke—Plans for the building of a first aid hospital here by the Delaware, Lackawanna & Western Coal Co., is announced. It is expected that this institution, the first of its kind in this section, will be ready for occupancy within a short time. Dr. C. E. Bennett, of Nanticoke, who has been chief surgeon of the company in this district will be the superintendent of the hospital. He will give up his private practice and devote his entire time to the hospital work. The hospital will be for the exclusive treatment of the miners working in and about the big collieries to the south of Wilkes-Barre. It will be one of the most modern structures in the state.

Bituminous

Johnstown—A deal has been closed whereby J. B. Kennerly and associates have purchased the holdings of the Meco Coal Co., three miles from Homer City, Indiana County, on the Yellow Creek branch of the Pennsylvania R.R. The consideration involved is in the neighborhood of \$100,000. One mine has already been opened and several others are planned, the purchase including 1,600 acres of coal.

Uniontown—All indications point to the motor ambulance fund reaching the desired amount in a short time. Many of the coal companies adjacent to Uniontown have contributed liberally to this fund as well as various fraternal organizations.

Connelsville—The coke production of the Connellsville region for the week ended Aug. 26 was reported as 397,495 tons, being 10,565 tons less than the production for the previous week.

Boswell—The office of the receivers of the Merchants Coal Co. was recently struck by lightning and completely destroyed, fire finishing the work begun by the lightning. This building was a substantial brick structure.

WEST VIRGINIA

Charleston—Reports received at relief headquarters in Charleston covering the district swept by the floods indicate that 528 families, comprising 2,433 persons, are destitute in the Cabin Creek section. Food and other supplies are being distributed among them as rapidly as possible, and additional contributions are being solicited.

Coal which has accumulated along the Kanawha River because of the conditions prevailing during the summer has begun to move toward the markets of the South and Middle West. All dams in the stream have been raised and steamboats are handling heavy tows.

In all mining fields of the state except on Cabin Creek, Coal River and Paint Creek, production is going forward at a satisfactory rate, and as rapidly as car and labor supply will permit. Even in these regions some of the mines have resumed shipments. It will, however, be October at least before all the mines in the flood zone can approach normal output. The railroad is pushing the work of cleaning up and rebuilding with all possible speed, but there is yet much to be done. The Four States Coal Co. at Dorothy has turned over 150 of its employees to the railroad, pending a resumption of mining.

Huntington—Notwithstanding the crippling of the Chesapeake & Ohio coal line by the flood on Cabin Creek and Coal River, the shipments for the month of August 1916 are ahead of those for the same month of the previous year. More than 2,500,000 tons of coal were sent out during the month just ended. It is said that this excellent record is due in large measure to the speed with which the Chesapeake & Ohio line was rebuilt, as it is believed that all records of railroad construction were shattered.

Beckley—The E. E. White Coal Co. shipments up to the present time this year exceed the total shipments of the same company for the entire year of 1915.

KENTUCKY

Island—Work has been begun on the shaft of the Justright Coal Co., which is planning to open a coal mine here. This is a co-operative concern, and it is said that this work will be rapidly pushed to completion. The mines in this vicinity are at present facing the worst car shortage in the history of the industry.

Whitesburg—One hundred indictments have been returned by the Letcher County grand jury charging violation of the local option laws in the mining district.

Due to the extremely heavy coal traffic from the Boones Fork and Elkhorn field of Letcher County extra trains are being added on the North Fork Branch of the Louisville & Nashville.

Pineville—Taylor & Crate, of New York, are found to hold valid title to 5,568 acres of coal and timber land in Bell and Harlan counties, according to a decision handed down by Judge A. M. J. Cochran in the Federal Court at Maysville, Ky. The case was against A. J. Asher and others who are enjoined from interfering with the plaintiffs and required to give an accounting.

Wheelwright—The Elk Horn Mining Corporation will build 300 miners' houses here and 200 on Jack's Creek where new developments are to take place at once. Already much of the initial work, of opening mines, grade work, building tipples, etc., is underway. This work is on the new Long Fork branch of the Baltimore & Ohio into the Left Fork of the Beaver Creek coal fields.

Seco—Manager H. LaViers and other officials of The South East Coal Co. here made a tour of the new development work at LaViers between Thornton and Millstone. A new mining town is under way at LaViers where a power station, tipples, etc., are being constructed and mines being opened.

ILLINOIS

Edwardsville—The temporary injunction for which application was made by the New Staunton Coal Co. against Louis C. Miller to restrain him from boring for oil on lands where the company has coal rights, has been denied by Circuit Judge Crow. The objection of the coal company to the prospecting for oil was that it would damage the mine and endanger the miners. The coal company will carry the case to the higher courts and obtain a final ruling on the respective rights of oil men and coal men operating in the same field.

Carlinville—Damage suits for \$45,000 were recently brought in one day against the Superior Coal Co. One was for \$25,000 for injuries, one for \$10,000 for a death and the third for \$10,000 for injuries.

Staunton—Coal operators of central Illinois are shipping large quantities of coal to Kansas City, following the refusal of the Interstate Commerce Commission to interfere with the reduced rate announced by the Chicago & Alton R.R. It is said that 1,500 tons are being shipped daily from Springfield. The reduction is from \$1.80 to \$1.25 a ton. The Springfield operators are selling direct to large consumers in Kansas City. It is expected that the shipments will be augmented rapidly.

Springfield—Permits have been obtained by the Springfield District Coal Mining Co. for the erec-

tion of two wash houses, to cost \$4,000 each, one at 19th and Monroe St. and the other at 8th and Hickory St. Each will be of brick and have two rooms.

FOREIGN NEWS

Vancouver, B. C.—Mining in general is prosperous throughout this province and that of coal is enjoying its share of the prosperity. The coal trade has materially improved and its future appears bright.

At the Provincial Exhibition held in this city during the current month Frank X. Frank was awarded first prize for the best coal in British Columbia. This coal comes from the Bulkley Valley, located on the main line of the Grand Trunk Pacific Transcontinental Ry. It is a hard smokeless coal and is produced only 125 miles from Tidewater. It is believed that this fuel will prove an important factor in Pacific Coast markets, where hard coal commands high prices.

Personals

William Palmer, superintendent of the Girard Mammoth Coal Co., has resigned.

Charles W. Taylor, of Greenville, Ky., has been elected president of the Western Kentucky Coal Operators' Association, to serve for the year.

W. W. Ferguson, superintendent of Mine No. 37 of the Consolidation Coal Co., will in addition thereto assume the duty of superintendent of farms.

J. E. Watson, Jr. has been appointed assistant to district superintendent George E. Peddicord, of the Consolidation Coal Co., with headquarters at Monongah.

James Ashworth, recently delivered a lecture on the coal industry in the mineral exhibit room at the fair held under the auspices of the Vancouver Exhibition Association at Hastings Park, Vancouver, B. C.

S. D. Dimmick, mining engineer, has been appointed as an assistant to general manager W. W. Inglis, of the Delaware, Lackawanna & Western Coal Department. He will have charge of inside construction.

Bradford Samson, formerly superintendent of construction for the Delaware, Lackawanna & Western Coal Department, has been promoted to have general supervision of outside work at the company's collieries.

W. J. Richards, president of the Philadelphia & Reading Coal and Iron Co., is taking a short vacation to the Mexican border on a visit to his son, who is a member of the National Guard from Pottsville, Penn., during duty there.

Howard M. Gassman, consulting engineer of Birmingham has opened offices at 720 to 721 Brown-Marx Bldg., Birmingham, Ala. His specialty will be mechanical and electrical engineering as applied to mining and manufacturing plants.

Erskine Ramsey, capitalist and business man of the Birmingham, Ala., district, it is believed will be nominated for Congress on a coalition ticket of Republicans and Progressives. Mr. Ramsey is well known throughout the Alabama coal region.

Ivan P. Tashof has resigned as instructor in mining and metallurgy at the College of Mines and Metallurgy of the University of Kentucky, and purposed to enter the practice of patent law with Messrs. Byrnes, Townsend and Brickenstein, of Washington, D. C.

George B. Smith, who has been superintendent and general manager, of the Pocahontas Big Vein Coal Co., has resigned that position. He will be succeeded by Sherman C. Maxey, who has long been identified with the Pocahontas field and vicinity. Mr. Smith has not announced his future plans.

Henry G. Davis, for many years superintendent of district No. 4 of the Delaware, Lackawanna & Western Railroad Co. coal department was on Sept. 1, promoted to assistant to General Manager W. W. Inglis, the appointment taking effect at once. Mr. Davis will have his headquarters at Scranton.

J. W. Cooper, formerly connected with the coal works near Wellsburg, W. Va., has returned there and will take a position with the new coal company that is opening mines on Buffalo Creek. Mr. Cooper has been in the West for several years, spending some time in Oregon, Utah and other Western states.

James C. Crawford, head of the Commercial Dept., of the Consolidation Coal Co., and a pioneer in the coal business of the Fairmont, W. Va., region, recently announced his determination to retire. Mr. Crawford came to the Montana mine 30 years ago, and has been connected with the company's stores in mining towns ever since.

H. H. Elkin, of St. Clairsville, Ohio, has been appointed superintendent of the Provident No. 1 mine at St. Clairsville, succeeding Hugh Gaffney, of Bridgeport, who resigned. Mr. Elkin has for some time been in charge of the safety work at the mine, and prior to coming to the local property was mining engineer with the Richland Coal Co.

Duncan McDonald, secretary of the United Mine Workers of Illinois has announced that he will

be a candidate for re-election. President Frank Farrington has not made an announcement but it is understood that he too will stand for re-election. John M. Zimmerman, of Springfield and Edward Wicks, of Staunton are opponents for representative on the National Executive Board. The election is to be Dec. 6 next.

Thomas D. Lewis has been appointed assistant to vice-president Edwin E. Ludlow, of the Lehigh Coal and Navigation Co., as successor to E. H. Suender, who resigned to become assistant to the president of the Madeira-Hill Coal Co. Ralph Kissinger, formerly chief clerk to Mr. J. W. Wariner, chief engineer, has been appointed chief clerk to Mr. Lewis, and Norman Tracy, of Lansford, succeeds to the position formerly held by Mr. Kissinger.

Frank H. Moser, has been appointed coal freight agent of the Lehigh Valley R.R., with offices at 133 Liberty St., New York. Mr. Moser was born in Mauch Chunk, Penn., entering the service of the Lehigh Valley in 1909. He became chief clerk to William T. Grier, who was then coal freight agent, and who later became general coal and freight agent. When Mr. Grier was appointed general traffic manager of the road, Mr. Moser was temporarily placed in charge of coal freight matters, and has now been definitely appointed to that position. Prior to entering the railroad service, Mr. Moser was connected with the coal mining industry in several capacities.

Obituary

Charles Upton Shreve, aged 88, retired capitalist, at one time prominent in the Kentucky coal trade as president of the Eureka Coal Co., died recently at his home in Louisville, Ky. He left a large estate.

John M. Hatfield, of Plainfield, N. J., died recently at his home from heart disease. He was connected with O. H. Perry & Sons, of E. 19th St., New York, and was a member of the Coal Merchants Association, and had been in the coal trade in New York City for over 37 years. He was 57 years of age at the time of his decease.

Edward F. Kingsbury, of Scranton, 82 years of age, died recently at his summer camp at Saratoga Springs, Me., from paralysis after several weeks' illness. Mr. Kingsbury was with the Lackawanna Coal & Iron Co., and the Scranton Steel Co. for over 31 years in various capacities. He was auditor and director of the DuPont Power Co., of Pennsylvania, for many years, and business manager and president of the Tribune Publishing Co.; also a director of many Scranton banks, coal companies, and other concerns.

Recent Coal & Coke Patents

Recuperative Coke Oven. A. Roberts, Evanston, Ill. 1193066 Aug. 1, 1916. Filed Dec. 4, 1914. Serial No. 875503.

Car-Lock for Mine Cages. W. A. Lubold, Gratz, Penn. 1195045 Aug. 15, 1916. Filed Aug. 31, 1915. Serial No. 859480.

Boiler Tube Scraper. J. A. Crepeau, Sorel, Quebec, Can. 1193361 Aug. 1, 1916. Filed Oct. 29, 1915. Serial No. 58722.

Method of Mining Coal. H. A. Kuhn, Pittsburgh, Penn. 1194298 Aug. 8, 1916. Filed Oct. 21, 1913. Serial No. 796497.

Fuel Supply Recording Device. G. C. Kerr, Brainerd, Minn. 1194640 Aug. 15, 1916. Filed Mar. 24, 1915. Serial No. 16664.

Coal Conveying Mechanism. A. L. Copley, Glenalum, W. Va. 1193124 Aug. 1, 1916. Filed Sept. 16, 1915. Serial No. 790114.

Regenerative Coke Oven. N. Schuster, Westminster, London, Eng. 1193830 Aug. 8, 1916. Filed Dec. 21, 1914. Serial No. 875475.

Cleaning Device for Marine Boiler Furnaces. J. K. Bruff, Baltimore, Md. 1192984 Aug. 1, 1916. Filed Nov. 10, 1915. Serial No. 60453.

Mining Machine. A. H. Wood, assignor to Jeffrey Mfg. Co., Columbus, O. 1193651 Aug. 8, 1916. Filed June 17, 1915. Serial No. 34704.

Furnace. W. McClave, assignor to McClave-Brooks Co., Scranton, Penn. 1192320 Aug. 1, 1916. Filed Dec. 19, 1914. Serial No. 878171.

Chain Grate Stoker. F. G. Britton, assignor to Babcock & Wilcox Co., Bayonne, N. J. 1192850 Aug. 1, 1916. Filed Dec. 16, 1914. Serial No. 877482.

Grate for Boilers. H. Straeten, assignor to S. Holt and P. R. Rauch, assignors to Leetonia Tool Co., Leetonia, O. 1195018 Aug. 15, 1916. Filed May 12, 1916. Serial No. 97072.

Fuel Made From Anthracite Coal Refuse and Process of Making Same. A. Schmidt, Philadelphia, Penn. 1192942 Aug. 1, 1916. Filed Sept. 2, 1909. Serial No. 515746.

Publications Received

"Annual Report of the Commissioner of Patents for the Year 1915." Unillustrated, 1,372 pp., 7½ x 11 in.

"Annual Report of the Smithsonian Institution, 1915." Illustrated, cloth-bound volume of 544 pp., 6x9 in.

"A System of Accounts for Retail Merchants." Federal Trade Commission. Unillustrated, 19 pp., 6x9 in.

"The Mineral Resources of Oregon." Published by the Oregon Bureau of Mines. Illustrated, 114 pp., 7x10 in.

"Personal Reminiscences of James Mates Dodge." By Charles Piez, the Link-Belt Co. Illustrated, 23 pp., 6x9 in.

"Fundamentals of a Cost System for Manufacturers." Federal Trade Commission. Unillustrated, 31 pp., 6x9 in.

"Investigation of the Peat Bogs and Peat Industry of Canada, 1913-1914." By Aleph Anrep. Illustrated, 179 pp., 6½x10 in.

"Report of the Department of Mines of Pennsylvania, Part I, Anthracite 1914." Cloth-bound volume of 614 pp. Unillustrated, 6x9 in.

"Report of the Department of Mines of Pennsylvania, Part II, Bituminous 1914." Illustrated, Cloth-bound volume of 1057 pp., 6x9 in.

"Sources of Nitrogen Compounds in the United States." By Chester G. Gilbert, Smithsonian Institution. Unillustrated, 12 pp., 6½x10 in.

"Limestones and Marls, Coastal Plain of Georgia." Geological Survey of Georgia, Bulletin No. 21. Cloth-bound volume of 300 pp. Illustrated, 7x10 in.

"Trust Laws and Unfair Competition." By Joseph E. Davies, Commissioner of Corporations, Department of Commerce, Bureau of Corporations. Unillustrated, 832 pp., 6x9 in.

"The Technology of Marble Quarrying." By Oliver Bowles, Department of the Interior, Bureau of Mines, Bulletin 106, Mineral Technology 13. Illustrated, 174 pp., 6x9 in.

"25th Annual Report of the Ontario Bureau of Mines, 1916; Part II, Lead and Zinc Deposits in Ontario and in Eastern Canada." By W. L. Uglow. Illustrated, 56 pp., 6½x9½ in.

"Strength of Webs of I-Beams and Girders." By Herbert F. Moore and W. M. Wilson. Bulletin No. 86, Engineering Experiment Station, University of Illinois. Illustrated, 50 pp., 6x9 in.

"Monthly Statement of Coal Mine Fatalities in the United States April, 1916." Compiled by Albert H. Fay, Department of the Interior, Bureau of Mines. Unillustrated, 24 pp., 6x9 in.

"Gas Analysis as an Aid in Fighting Mine Fires." By George A. Burrell and Frank M. Selbert, Department of the Interior, Bureau of Mines, Technical Paper 13. Illustrated, 16 pp., 6x9 in.

"Coke Oven Accidents in the United States During the Calendar Year 1915." Compiled by Albert H. Fay, Department of the Interior, Bureau of Mines, Technical Paper 151. Unillustrated, 18 pp., 6x9 in.

"The Production of Explosives in the United States during the Calendar Year 1915." Compiled by Albert H. Fay, Dept. of the Interior, Bureau of Mines, Technical Paper 159. Unillustrated, 24 pp., 6x9 in.

"Quantity of Gasoline Necessary to Produce Explosive Conditions in Sewers." By G. A. Burrell and H. T. Boyd, Department of the Interior, Bureau of Mines, Technical Paper 117. Illustrated, 17 pp., 6x9 in.

"Sensitivity to Detonation of Trinitrotoluene and Tetranitromethylanilin." By Guy B. Taylor and Willard C. Cope, Department of the Interior, Bureau of Mines, Technical Paper 145. Illustrated, 13 pp., 6x9 in.

"The Compressibility of Natural Gas at High Pressures." By G. A. Burrell and I. W. Robertson, Department of the Interior, Bureau of Mines, Technical Paper 131, Petroleum Technology 31. Illustrated, 12 pp., 6x9 in.

"Effect of Temperature and Pressure on the Explosibility of Methane-Air Mixtures." By G. A. Burrell and I. W. Robertson, Department of the Interior, Bureau of Mines, Technical Paper 121. Illustrated, 14 pp., 6x9 in.

"Strength and Other Properties of Concrete as Affected by Materials and Methods of Preparation." By R. J. Wig, G. M. Williams and E. R. Gates, Department of Commerce, Bureau of Standards. Illustrated, 172 pp., 7x10 in.

"Construction and Operation of a Single Tube Cracking Furnace for Making Gasoline." By C. P. Bowie, Department of the Interior, Bureau of Mines, Technical Paper 161, Petroleum Technology 35. Illustrated, 16 pp., 6x9 in.

"Monthly Statement of Coal Mine Fatalities in the United States May, 1916, with List of Permissible Explosives, Lamps and Motors Tested Prior to June 23, 1916." By Albert H. Fay, Department of the Interior, Bureau of Mines. Unillustrated, 28 pp., 6x9 in.

Industrial News

Flushing Bay and Creek, 95,072 tons of coal and other fuel, with a valuation of \$398,093.

Charleston, W. Va.—Thomas Story, of Point Pleasant, W. Va., has received from the Consolidated Coal and Mining Co. a contract for the construction of 40 miners' cottages, and other contracts are to be let by the company which is rapidly clearing up the damage caused by the recent flood and reconstructing its mine buildings and miners' dwellings. Probably 1,500 men are engaged along Cabin Creek in reconstruction work.

Philadelphia, Penn.—Gross earnings of the Philadelphia & Reading Coal and Iron Co. increased \$862,130 for the month of July, with a surplus of \$5,987. While the surplus is relatively small it shows quite an improvement over the deficit of \$79,337 for the same period of last year. This company usually shows a deficit during the summer months, but recovers in the fall and winter season when coal shipments are at their highest.

Youngstown, Ohio—The Youngstown Sheet & Tube Co. recently tried out the byproduct gas on its four furnaces in the 18-inch mill of the East Youngstown Plant. The new arrangement worked with entire satisfaction, and all furnaces in this mill are now running on the byproduct gas, and the natural gas has been discontinued. The mill boilers have been fired with the new gas for several days all four batteries of 51 ovens each being now in operation.

Ebensburg, Penn.—Activities on the John Kirschner farm west of Ebensburg, indicate that an extensive coal operation similar in size that at Colver will be established there by Messrs. B. D. Coleman, of Lebanon, and John H. Weaver, of Philadelphia, who own and operate the Colver plant. The Kirschner operation will probably be a sister to that of Colver. A deep shaft, many new houses, office buildings, stores, church, school, etc., will be constructed.

Kansas City, Mo.—The increased railroad demand for coal in Kansas is reviving reports that some of the roads are extensively changing over to coal. It is said that the Santa Fe is planning this change. This road is reported to have a million barrels of oil stored in Oklahoma, bought at an exceedingly low rate nearly two years ago; which it is not going to use at present, but will hold for reserve for a real emergency. It is now buying oil at nearly four times the cost of this oil that is in storage.

Cincinnati, Ohio—The Glen Mary Coal and Coke Co. has filed in the United States Circuit Court of Appeals its appeal from the judgment of the United States District Court for Eastern Tennessee awarding a judgment against it of \$45,924.66 in favor of Edith McBurney Wolfe, et al. The case involves the title to certain coal lands, and the amount of the judgment covers the value of coal alleged to have been removed by the company from land formerly the property of the late Samuel McBurney.

Columbus, Ohio—Earnings of the Hocking Valley R.R. for June, just issued by Auditor F. D. Hodgson, show net revenues \$272,872, or an increase of 53 per cent., compared with the same month last year. The expenses were \$600,276, an increase of \$267,974, or 81 per cent. The net income shows a deficit of \$84,068 compared with a balance of \$60,337 a year ago, a decrease of \$144,405, or 239 per cent. For the 12 months ended June 30 the net income was \$1,081,765, an increase of \$588,363, or 119 per cent.

St. Louis, Mo.—Coal dealers of East St. Louis are trying to get together on an agreement to eliminate time-payments and put their operations on a strictly cash basis. Dealers say that the credit phase of the business has reached such proportions that they are in danger of being wrecked by it. The plan is to make contracts to cover the period until the end of the year. The dealer will bind himself to deliver at a fixed price, but he will require that when delivery is made cash must be paid. The inducement held out to purchasers is that with the elimination of credit better coal can be furnished for the same or a lower price.

Philadelphia, Penn.—Reports reaching here point out the urgent demand for coal in South America, as on account of the severe winter weather now prevailing in Argentine, Paraguay, Uruguay and southern Brazil there is actual distress among the population owing to the lack of fuel. In Buenos Aires it is stated that coal is bringing from \$35 to \$40 a ton. The bulk of the fuel was formerly supplied by shipments from Great Britain, which have now been shut off, and it is pointed out that if American shippers seize the present opportunity the market could be won for many years to come.

Harrisburg, Penn.—John B. Hanlon, president of the Mine Inspectors' Examining Board, for Luzerne and Carbon Counties will probably order an examination for the purpose of certifying a candidate or candidates for the vacancy caused by the recent resignation of Inspector Samuel J. Jennings. There is but one man in the district holding an inspector's certificate who does not occupy a position as inspector. He is Mr. Hugh McDonald, of Pittston, who voluntarily retired some time ago after serving for about 30 years. As matters stand he is the only man the court is permitted to appoint, hence the intention of the president of the board to create a new crop of eligibles.

Market Department

GENERAL REVIEW

Threatened stoppage of transportation caused a heavy business in anthracite and prices continue stiff. Bituminous market easily absorbs surplus accumulations of speculative coal and continues firm. Lake shipments considerably behind. Urgent demand in the Middle West.

Anthracite—The market has withstood the unsettlement occasioned by the railroad controversy in an impressive manner. Moderate reactions from the tense conditions prevailing during the period of uncertainty were inevitable, particularly when supplemented by the increase in the circular prices to the maximum level of the year, but these have in no case been of large proportions, and quotations continue to rule substantially about the average normal level for this period. Orders were so plentiful and of such an urgent character during the progress of these labor negotiations, that it is not unlikely that most of the trade, including both the wholesalers and retailers, did such a large business that they can well afford a period of comparative inactivity for two, or even three weeks. Mine outputs are still handicapped by the inadequate car and labor supplies, and even with the threatened cessation of transportation facilities now eliminated, there is still some anxiety as to the outlook on certain sizes. Increasing anxiety is noted at Down East points, over the slow arrivals there and indications are that buyers may soon be forced into the speculative market for their requirements.

Bituminous—The market is once more getting into its normal stride, following the disturbed conditions occasioned by the uncertainty over the railroad labor controversy. Considerable coal was accumulated for speculative purposes when the situation seemed acute, but the market has absorbed this tonnage without any apparent effort and at relatively high prices, although not of course at the maximum figures quoted when the transportation situation seemed most acute. The more conservative of the consuming interests are snapping up all offers of free coal at anything approaching normal prices while some buyers are now canvassing the coal regions for extra tonnage. Increasing shipments and additional inquiry from abroad is directing more attention to the export trade, and a significant development in this connection is the receipt of a good many repeat orders from new markets which would seem to indicate a greater popularity for American fuels than has been accorded them in the past.

Lake Market—The urgent demand became less pronounced on the announcement that there would be no strike of the railroad employees, but the market continues sufficiently firm to justify some doubt as to whether the recent advance can be attributed entirely to this cause. The car shortage continues a controlling factor in the situation, and some industrial operations are being hard pressed to obtain sufficient supplies to keep going. From present indications there seems to be little probability of the producing interests being able to make any appreciable increase in the output. The domestic trade will also be an important factor in the situation very shortly. The diverting of considerable business from the flooded zone in West Virginia to Ohio producers has had a further stiffening influence. Estimates of the shortage at the Upper Lake docks are becoming larger as the season advances, and every effort is being made to crowd shipments in that direction.

Middle West—The active situation precipitated by the threatened suspension of transportation facilities carried the market through the first of the month advance in price schedules without a hitch. The railroads took over such large tonnages for their own use that there was very little left for commercial purposes. Even the final agreement on terms satisfactory to the men made little difference in the situation aside from relieving the anxiety of the consumers, and it is generally felt that the natural demand will be sufficient to maintain current prices through the balance of the season. That the large agencies feel assured of their position is evidenced by the withdrawal of a great many salesmen from the road. The situation in the Northwest looks more critical as the season advances; Lake shipments to the upper ports show an apparent shortage of 2½ million tons, which it will be impossible to make up. More Middle Western coal is going in that direction though shipments are largely restricted by the inadequate car supply.

A Year Ago—Fall buying of anthracite opening up. Bituminous feeling the impetus of the improved industrial conditions. Profitable figures on export business. Lake trade shows a gratifying increase. Notably better tone in the Middle West.

BUSINESS OPINIONS

Iron Age—For the Allies the taking up of large lots of shell steel discards, further accents the scarcity of the forms of steel for which they have been scouring the market lately. Two Central Western steel companies have disposed of about 100,000 tons of such material, and the supply is now about cleaned up. The July exports of iron and steel reported were 496,000 tons, against 527,000 tons in June and 540,000 tons at the highest rate, which was in May. It is not to be concluded from these figures that the high point has been reached in the war boom, but the export movement will be closely watched for signs of the turn. Steel works order books do not show it. The placing with a Western maker of 4,000 small gondola-type cars is the only tangible outcome thus far of the long negotiations for rolling stock for Russia. Many more cars are needed, but the deal has taken a devious road. Further sales of ship steel have been made to Japan, including 10,000 tons of plates.

American Wool and Cotton Reporter—More wool was sold last week than for several previous weeks, the sales totaling 5,000,000 lb. One house alone disposed of 1,000,000 lb. Manufacturers are making large purchases, compared with previous ones. Indications point to the fact that manufacturers are well covered on supplies. Conditions in the wool goods market necessitate a great deal of conservatism. Buyers are going as slowly as possible, especially on lightweight worsted suitings or those which will be used for the spring season.

Boston News Bureau—Congress is on the eve of adjournment. This is a favorable factor. A curious phase of the general situation is that in spite of poorer crops and doubtful legislation, sentiment is still dominated by conditions generated by the war. The lure of the American dollar governs the action of the people as never before. Our prosperity has destroyed our sense of proportion. It is this feeling that has and is generating a spirit of intense speculation. We are basing values upon earnings that are phenomenal and exceptional. They do not represent the growth of the country, but rather the stupendous requirements of Europe. It is reasonable therefore to suppose that when these exceptional demands cease, our prosperity will shrink to below normal proportions. The averting of the strike has put renewed life in industrial circles. There is less talk concerning the probable end of the war.

Bradstreet—Concern over the beclouded railway labor situation is widespread, and the placing of embargoes on freight has caused considerable unsettlement in practically every channel, but the very fear of a strike seems to have developed an onrush of orders as well as hurry calls to ship staple merchandise for which contracts were placed earlier in the season. Thus an already active situation has been further stimulated by this belated effort to stock up, and in consequence railway congestion making factors are in evidence. Aside from the labor situation indicated, the week has been one of soaring prices for necessities with remarkable activity in all but a few lines.

Dun—Embargoes on freight shipments and some cancellations of contracts because of uncertainties as to deliveries, due to the threatened transportation tie-up, characterized the situation during the week. Yet, in spite of these conditions business made further substantial headway, new projects in most instances being undertaken with sustained confidence. Current buying continues noteworthy, though ordinarily it might be checked, and divergence between supply and demand is still a factor of strength in many markets. Prices in leading lines tend upward steadily, but, while the high costs naturally cause some hesitancy, consumption is not lessened perceptibly. Commercial failures this week in the United States, are 277 against 273 last week, 352 the preceding week, and 329 the corresponding week last year.

Marshall Field & Co.—The current week has been marked locally by a good wholesale trade. More customers have attended the market, and their purchases are well ahead of the same week last year. Road sales for spring and fall delivery show a considerable gain over the corresponding period of 1915. Shipments are better than in the week a year ago. Collections are above normal. The market on domestic cotton goods is very strong.

Dry Goods Economist—Labor Day marks the beginning of the fall season with retailers. In consequence, the great majority of buyers who were in the New York market have returned home. The further advance of raw cotton on unfavorable crop reports gave a further boost to the cotton goods market this week.

Atlantic Seaboard

BOSTON

The smokeless coals in short supply, and prices soaring for spot cargoes. Most agencies confined to contract obligations. Georges Creek shipments almost cease coastwise. Receipts of Pennsylvania coals continue light at Tidewater, with "strike" prices ruling a week ago. Anthracite shippers still farther in arrears.

Bituminous—The threatened railway strike had marked bearing on the market for several days. Discharging of steamers at this end was rushed in order to get them to the loading piers before a tie-up went into effect, and spot sales were made at new high figures. At this writing \$3.50 was the current price for prompt Pocahontas and New River, while \$4 was paid for small lots to clear ships during the middle and latter part of last week. Anything extra in the way of tonnage whether off-shore or coastwise had difficulty in getting accepted, the output being so reduced as not to permit shippers to undertake more than a fraction of the new business offering. Charterers of transportation that was originally intended to load at Philadelphia or Baltimore are embarrassed to find so little chance for loading at Hampton Roads.

The proportion of coal for export is still very large and has every prospect of continuing so. Some of the brokers, however, who made quotations to South America and elsewhere based on prices a month ago find that the advanced market has wiped out their profits. The heavy foreign demand is having its effect on the volume of receipts in New England. Several large consumers in this territory are operating on very narrow margins of stock, and there is a lot more anxiety over the future than is apparent on the surface.

At the same time "market cargoes" have not yet appeared to any extent, due partly to the high range of marine freights and partly to the shortage of coal at Hampton Roads. It is likely that speculative coal will soon appear, however, in response to the spot demand that will almost surely develop. This deficiency in supply will first appear among those consumers who have coal due them from Philadelphia and Baltimore, rather than from Hampton Roads. While several of the latter shippers are behind on their obligations they are not yet far enough in arrears to cause alarm for the present. Many manufacturers have been quietly taking other coals all-rail in order to be assured more comfortable stocks. Cargoes of Georges Creek are now few and far between for this market. Fleet units usually carrying this grade are loading other coals at New York, Philadelphia, or Hampton Roads, until Baltimore piers have the coal to furnish. As at Hampton Roads the loadings for export are fairly regular. The very much curtailed output is causing real alarm on the part of large consumers here who are depending upon their contracts for Georges Creek to see them through. In New York and Philadelphia there is still almost none of this grade to be had.

The Pennsylvania shippers continue to sell very conservatively. Small tonnages are let out from time to time at current prices, but practically all the agencies are short of futures. Receipts along the coast are much hampered by high-water freights and the scarcity of suitable boats. All-rail movement of these coals has been regular and in good volume. A few sections have been troubled by embargoes, but at this writing coal in all directions by rail into New England is moving freely. There was interruption only for a few days while the trainmen's strike was a possibility. Some days last week there was actually no spot steam coal on hand at two or three of the New York loading ports.

The Boston retail price of bituminous was advanced 25¢. to \$5.50 per net, effective Sept. 1. This compares with \$4.40, the price a year ago.

Bituminous quotations at wholesale, f.o.b. loading ports at points designated, are about as follows, per gross ton:

	Clear-fields	Camb. & Som'st	Geo's Creek ¹
Philad'l'a...	\$2.50@3.20	\$2.80@3.35	\$3.07@3.17
New York...	2.80@3.50	3.10@3.65	3.37@3.47
Baltimore...			3.00@3.10
F.o.b. mines	1.25@1.95	1.55@2.10	2.00@2.10

¹ On contract.

Pocahontas and New River are quoted at \$3.50 per gross ton. Norfolk and Newport News, Va. On cars Boston and Providence the range for the same coals is \$5.50@6.

COAL AGE

Anthracite—While the clearer weather has helped the movement of tons the shortage of domestic sizes at practically all the piers has continued to make receipts light in this territory at points reached via water. The dealers are increasingly worried as the season advances and the heavy September demand is right on top of them. Egg and broken are still the sizes in shortest supply, with stove getting less available.

Effective Sept. 1, two or three of the New York shippers who control their own barge transportation to Boston points announced that rates were advanced 25c, so presumably the present water freight on those barges is figured at 75c. Instead of 50c.

NEW YORK

Some premiums offered for quick delivery of anthracite. Chestnut taking full price. Steam sizes easy. Bituminous market reacts at conclusion of railroad negotiations. Demand strong and supplies short.

Anthracite—The threatened tie-up of the railroads was negligible on the anthracite market. There was very little increased ordering as the dealers felt there would be no tie-up. Demand continues heavy and some dealers have been offered small premiums for quick deliveries. Free coals are scarce while most shippers accept orders subject to delay in shipment. Orders for delivery extending over several weeks are as a rule, refused, and predictions of 50c. premiums on domestic coals by Oct. 1 are heard.

Production is not up to normal and some operators are hesitating before taking on new customers. Individuals have sufficient orders ahead to take their product for some time.

All domestic coal sent to Tidewater is easily taken up and the only delay in shipment is the scarcity of bottoms. Egg and stove sizes remain scarce while chestnut is gaining strength, due to the insistence of shippers that a portion of each delivery shall contain some of this size. With only an occasional exception all free chestnut is bringing full company circular. Pea coal is easy but prices are firm, very little concessions being made. The better grades are scarce.

The steam sizes are plentiful. Demand is slow and prices easy. Some cheap grades of buckwheat No. 1 can be had at 25c. below full price. Buckwheat No. 2 is the longest of these coals and some shippers are asking for offers to move their holdings.

Current quotations, per gross ton, f.o.b. tide-water, at the lower ports are as follows:

	Circular	Individual
Broken	4.95	
Egg	5.45	5.45@5.55
Stove	5.70	5.70@5.80
Nut	5.75	5.75
Pea	4.00	3.90@4.00
Buck	2.75	2.65@2.75
Rice	2.20	2.10@2.20
Barley	1.95	1.85@1.95
Boiler	2.20	

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—The threatened tie-up of the railroads made a decided impression on the bituminous market. Quotations advanced quickly and when it was felt certain that the difficulty would be settled there was a noticeable reaction. Some few speculators, who had taken advantage of the situation expecting to realize still higher prices, hastened to dispose of their coal. During the few days of anxiety quotations jumped and on Thursday they were above \$4. Sales were reported at \$3.90. The next day, however, when it became evident that the labor trouble would be settled the market eased off and quotations fell to about \$3.50, taking a still further drop of 25c. for ordinary coals the following day.

This week opened with the market steady. Demand was brisk but outside of the contract coals there was little in evidence. Free coals are scarce. Some large users with running contracts are buying in the open market. The coal regions are being thoroughly canvassed by buyers from New England and as a result mine prices are stronger than on the Tidewater basis, fancy coals being held near the \$2.25 mark with other grades quoted at from \$1.40 to \$1.95.

Labor and car shortage continue to interfere with production and some mines are getting out less than 60% of normal capacity.

Inquiries for export coal are numerous and some contracts at prices from 30 to 45c. over quotations of last spring are reported as being closed.

Current quotations, per gross ton, f.o.b. Tide-water, for various grades follow:

Port	Reading	St. George	Mine Price
George Crk.	\$3.50@3.75	\$3.50@3.75	\$1.95@2.20
Big Vein	\$3.50@3.75	\$3.50@3.75	\$1.95@2.20
Tyson	3.30@3.50	3.30@3.50	1.75@1.95
Clearfield	3.20@3.35		1.65@1.80
South Frk.			1.95@2.15
Nanty Glo.			1.85@1.95
Sonr. Co.	3.25@3.40	3.25@3.40	1.70@1.85
Que'ho'ing	3.10@3.20	3.10@3.20	1.55@1.65
W. V. Pa'rm't			
Th'r'qua.	3.25@3.30	3.25@3.30	1.45@1.50
Mine-run	3.20@3.25	3.20@3.35	1.40@1.45
West. Md.	2.95@3.00	2.95@3.00	1.40@1.45

PHILADELPHIA

Anthracite—Market unsettled by strike rumors. Orders heavy, wholesale and retail. All sizes in good demand, with chestnut improving. Steam coals active. Better collections. Sudden rise in bituminous, but prices again react to about normal. Coast shipments good, but exports only fair.

Anthracite—Due to anticipation of a strike, the market was in a fever of excitement during the first days of the month, but at this time matters have eased off to almost normal. It is not unlikely that most shippers sold sufficient coal during the unsettled period to carry them through the first three weeks of the month. Conditions were most unusual and the harvest has by no means been confined to the wholesalers. The retailer enjoyed a flood of orders that would ordinarily require a severe winter blizzard to produce. The retailers have all along expected a good fall and winter's business, but the sudden and early buying due to the strike scare was particularly pleasing, as every cellar filled now will mean so much less work when severe weather arrives. Even should there be a reaction and business fall off for a few weeks there has been much accomplished and at good prices.

The dealers hardly needed the added incentive to cause them to buy, but the demands on them meant greatly increased calls on the shippers. And despite heavy ordering shipments, especially by the big companies, have been unusually light for some weeks and some sizes have been scarce enough to cause alarm to several large buyers. The manufacturing interests have also been urgent in their requests for consignments on account of their contracts. Altogether it has been a most strenuous effort to keep all interests anywhere near satisfied.

Despite the excellent condition of the market price-cutting among the retailers has broken out again in the Kensington district, with concessions as much as 50c. a ton being made on some sizes.

Broken coal, which has been in such unusual demand on contracts, is still in short supply locally. All the dealers who have a small amount of business on this size, either for small manufacturing concerns, or domestic use, have been unable to obtain even the few cars necessary to supply their trade. It is not a question of price, but they gladly pay the full circular of \$3.60.

Egg requisitions show no sign of diminution and one hears of no price cutting on this size; in previous years at this time, even with the lower circular, there was much cutting, but now \$4.15 is secured without difficulty.

The demand for stove is even greater than ever and shippers are beginning to look upon the situation as hopeless. Business placed early in August is, in numerous cases, still unfilled, and some of the operators are now refusing orders unless accompanied by chestnut. Many of the retailers, acting on the suggestion of their shippers, are urging their trade to try other domestic sizes in order to relieve the pressure on stove.

Chestnut is gaining the needed strength, but the orders for this size have not kept pace with the others. The price is generally \$4.50 except for off coals.

Pea is being bought quite heavily and is now causing no concern. This size is sure to sell without solicitation for the balance of the season and no good grades can be purchased now at less than \$2.80. This size and stove are the two most likely to bring premiums this coming winter.

Much complaint is being heard from the few selected buyers who early in the season placed blanket orders for all sizes at prices considerably below circular. Shipments have been so slow that they have been compelled to go into the open market and plead for coal at circular rates. The shippers who made the mistake of selling this coal too early, and unnecessarily sacrificing the prices, now find themselves the objects of much unfavorable criticism.

The steam coals are in an excellent position, with practically all shippers well sold up on buckwheat, while the other sizes such as rice, boiler and barley are also in good demand, having lost but little of the impetus they gained during the strike scare.

The shippers are also reporting collections improving, as is usually the case at this time of year, when coal begins to move from the retail yards, but this phase of the business was also stimulated by the exciting events of the past week.

Prices per gross ton, f.o.b. cars, at mines for line shipment and f.o.b. Port Richmond for tide shipment are as follows:

	Line	Tide	Line	Tide	
Broken	\$3.60	\$4.75	Buck...	1.65	2.55
Egg...	4.15	5.25	Rice....	1.00	
Stove...	4.40	5.60	Boiler...	.90	1.80
Nut....	4.50	5.55	Barley...	.75
Pea...	2.80	3.70			

Bituminous—The threatened strike was the disturbing element in the market this week, the effects of which have not as yet worn off, except that all breathe easier now that the impending clash is settled for the time being. During the height of the scramble for fuel the question of quality was disregarded entirely, it being simply a matter

of getting coal of any kind. Spot coal standing at the piers quickly advanced to prices ranging from \$2 to \$2.70, while cars in transit sold from \$1.75 to \$2.25. Of course, on the receipt of the news from Washington of the passage of the eight-hour law, the prices rapidly receded from these figures, but even at that most grades at this time now show a fair increase over the normal level of last week.

An element which always crops up in a rising market is again beginning to show itself, and that is the number of mines being offered for sale. These are usually operations whose product is not very desirable and the owners take advantage of the situation to dispose of them. One shipper reports three tenders of this kind being made to him in one day.

Tide shipments to coast points have recently been quite heavy, although foreign shipments have fallen off, most of the exports that are being made going to South American ports.

Prices per gross ton, f.o.b. cars at mines, are as follows:

Georges Creek Big Vein	\$1.95@2.10
South Fork Miller Vein	2.00@2.05
Clearfield (ordinary)	1.50@1.65
Somerset (ordinary)	1.55@1.60
West Va. Freeport	1.40@1.50
Fairmont gas	1.65@1.70
Fairmont gas, mine-run	1.50@1.70
Fairmont gas, slack	1.30@1.35
Fairmont lump, ordinary	1.45@1.50
Fairmont mine-run	1.35@1.45
Fairmont slack	1.30@1.35

BALTIMORE

Price advances made under strike fear well maintained and coal is scarce. Anthracite men caught in flurry also.

Bituminous—Prices advanced sharply toward the close of last week when it seemed certain that a vast railroad strike was coming and when it was realized that Baltimore did not have enough coal even for immediate necessities in many cases. At the close of business last Saturday any coal at tide or on cars for this point was commanding from \$3.25 to \$3.50 a ton, mine basis, or about double the price of a week previous. With little or no coal free here over Labor Day and the poor period of production which always follow such a time of celebration, the trade remained exceptionally firm and good steam coals at tide are still around \$3, mine basis.

The week was one of excitement to the trade, large profits to a number of coal men who were fortunate enough to have any free coal on hand and one in which consumers paid, in many cases, almost anything asked. It was clear that business interests here had for the most part utterly ignored the warnings that a strike would bring a fuel famine and the firm tendency holds even after the immediate cause has been removed by cancellation of the strike order.

Tuesday morning saw the first real break in the market, when a rush of coal came through on all the railroads centering here. A much lighter inquiry was noted and added softness to the situation. Steam coals of all varieties dropped here to a mine basis price of \$2 to \$2.25, thus ending the short but healthy boom that had carried prices locally to as high as \$3.50 generally, and in some cases \$3.75, mine basis, the highest since the anthracite strike of 1903.

Anthracite—While price changes did not figure in the situation, the anthracite dealer also passed through a period of excitement. Every dealer here was deluged with orders for immediate delivery and urged to finish up those on the books. The trade usually takes August and early September to clear up business placed during the summer by customers who do not use fuel until the winter weather sets in. Some dealers pushed their deliveries but others advised caution and promised that there was enough yard supply of anthracite to meet all immediate needs long past any period over which a strike could extend into cold weather.

HAMPTON ROADS

Shipments heavy, both foreign and coastwise. Bunker demand good. Stocks very light. Prices soaring.

The movement, for export and coastwise account, is large. There is no lessening of the foreign demand and coastwise shipment is increasing, particularly to New England ports. Shipments foreign still show the same range of destinations as in recent months, indicating that the coals of Hampton Roads are being favorably received. One former criticism of American coal, its small size, has been eliminated as the foreign consumer has a chance to try the coal and learn its high quality.

Among the exports of the past week it is interesting to note the cargo of Pocahontas shipped for a whaling station at South Georgia, about as far south as it is possible to go. About a year ago a similar cargo was sent to a whaling station in the Falkland Islands. These stations formerly received their supplies from England, but have expressed themselves as well pleased with American coal.

The requirements of the Navy Department have been heavy for the past week. Five Navy colliers, aggregating some fifty to sixty thousand tons,

were loaded, in addition to a large number of Naval barges.

The New England market is badly in need of coal and sales are reported at \$6.50 at Mystic Wharf, Boston. Foreign freights show an easier tendency, which will probably return some of the American schooners to the coastwise trade. Going rates from Hampton Roads to Boston are quoted at \$1.85@2 for large carriers.

The requirements of bunker steamers still remain large. This is partly normal demand, though on account of the scarcity of coal on the other side a number of steamers bunker at Hampton Roads for the round voyage.

The total dumpings for the three Hampton Roads coal roads for the month of August were: Norfolk & Western, 821,412 tons; Chesapeake & Ohio, 446,918 tons; Virginian, 386,361 tons; total, 1,654,691 tons. As will be noted, the Norfolk & Western dumped to within a few thousand tons of the combined tonnage of the Chesapeake & Ohio and Virginian. There are a large number of vessels waiting for cargo, but it is not expected that the dumpings for September will equal August on account of the poor receipts of coal over all roads. Custom House figures show the coal exports of Hampton Roads for the year ending June 30 as 5,654,679 tons.

On account of the heavy demands in anticipation of a railway strike supplemented by the light shipments, stocks are down to almost nothing. All shippers are short and have a number of vessels waiting for cargo. Last week all classes of consumers were endeavoring to protect themselves and stock up, which resulted in an unprecedented demand, particularly in the local market. A number of consumers had to pay dearly for what little coal they were able to get. Shippers with any surplus had no difficulty in securing almost any price. Sales were reported as high as \$3.50 per net ton on track.

Contract demands of all shippers are so heavy and free coal so scarce that quotations are nominal and not given for future delivery. The ruling prices at present are, for Pocahontas and New River, for cargo shipment, both foreign and coastwise, \$3.50@4 per gross ton, for local delivery \$3@3.50 per net ton on track, for bunker delivery \$3.50@4 per gross ton, plus 10c. per ton trimming. The high-volatile coals are in good demand, also commanding about \$3@3.50 per gross ton. Anthracite sells at \$7.50 per net ton delivered.

Railroad Tonnages—The following is a comparative statement of the tonnages handled by the different roads for the weeks ended Sept. 2, 1915-16, and for the first 10 weeks of the last half of the years:

	Week		10 Weeks	
	1915	1916	1915	1916
Nor. & West.	232,394	179,329	1,875,683	1,618,566
Ches. & Ohio.	82,485	87,723	967,636	969,828
Virginian.....	72,302	83,750	679,522	878,256
Total.....	387,181	350,802	3,522,841	3,466,640

PANAMA CANAL

Fuel movement through the canal for the week ended Aug. 20 was as follows:

Vessel	From	To	Tons
Buenaventura	Norfolk	San Diego	7,151
Good Hope	Norfolk	Mejillones	5,707
Greenwich	Philadelphia	Valparaiso	*2,319

*Coke.

On Aug. 29 the canal was closed by slides and at latest reports, Sept. 5, no vessels had been able to pass, though it was expected to have it cleared almost daily.

Ocean Shipping

OCEAN CHARTERS

Coal charters have been reported as follows during the past week:

PHILADELPHIA			
Vessel	Destination	Tons	Rate
Henry Tegner	Havana	865	
Fjell	Manzanillo	581	
Balboa	Santiago	372	

VIRGINIA			
W. M. Critchett	Bermuda		
Brookwood	River Plata	1,987	\$15.00
J. M. W. Hall	Los Palmas	491	
Alex. Kjelland	River Plata	1,815	14.40
Majoren	Rio Janeiro	1,949	12.50
Queen of Scots	Montevideo	1,296	12.00
C. A. Donnell	Barcelona	4,990	32.00

ATLANTIC RANGE			
Canfield	River Plata		1,718
NEW YORK			
Geo. H. Ames	Halifax		3.25

BALTIMORE			
Skinfaxe	Port Limon		964
Banan	Tela		948
Honduras	Santa Marta		704
Santa Cecilia	Rio Janeiro		4,026
Finland	River Plate		1,599

*Coke.

OCEAN FREIGHTS

Since our last report we chartered a large number of steamers for export coal, but the majority of these fixtures were not reported. During this period a steamer was chartered by others, from Virginia to Rio, at or about \$14 net, and we chartered steamers for the same voyage, at \$12.50 net, which charters we can duplicate. We also chartered a number of steamers for coals to the Lower Plate, at or about \$14.40. Rates to the Mediterranean are easier for prompt tonnage, but rates to the Windward are firmer.

We would quote freight rates on coal by steamer as follows:

	Aug. 29	Sept. 5
West Coast Italy.....	\$27.60@28.80	\$26.40@28.80
Marseille.....	26.40 about	25.20 about
Barcelona**.....	24.00 about	21.60@24.00
Montevideo.....	15.00 about	14.40 about
Buenos Aires.....	15.00 about	14.40 about
Rosario.....	15.60 about	15.60 about
Rio Janeiro.....	13.50@14.00	12.50 about
Santos.....	14.00@14.50	13.00 about
Chile (good port).....	8.00@10.00	9.00@10.00
Havana.....	3.75@4.00	3.75@4.00
Cardenas, Sagu.....	5.00@5.50	5.00@5.50
Ciuefuegos.....	5.25 about	5.25 about
Port au Spain.....	5.50@6.00	5.75@6.00
St. Lucia.....	5.50 about	5.75@6.00
St. Thomas.....	5.00 about	5.25@5.50
Barbados.....	5.50@6.00	5.75@6.00
Kingston.....	5.25@5.50	5.00@5.50
Curacao**.....	5.00@5.25	5.00@5.25
Santiago.....	5.25@5.50	5.00@5.50
Guantanamo.....	5.25@5.50	5.00@5.50
Bermuda.....	4.25@4.50	4.25@4.50
Vera Cruz.....	5.50@5.75	5.50@5.75
Tampico.....	5.50@5.75	5.50@5.75

* Spanish dues for account of cargo. ** And p.c.

2 Or other good Spanish port.

Note. Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

W. W. Battie & Co.'s Coal Trade Freight Report.

VESSEL CLEARANCES

The following vessels have cleared with coal cargoes during the past week:

NORFOLK

Vessel	Destination	Tons
Carlo ⁹	Savona, Italy	6,423
Kongslis ⁹	Buenos Aires, A.R.	8,211
Tea ¹	Livorno, Italy	6,474
Erik II ⁸	Para, Brazil	2,622
Viva ³	Valparaiso, Chile	2,211
Hugo ⁶	Ciuefuegos, Cuba	*217
Governor Powers ⁵	Lisbon, Portugal	2,525
Bella ⁷	Cardenas, Cuba	751
Lewisham ³	Pisagua, Chile	3,869
Veratr ⁹	Puerto Padre, Cuba	2,192

NEWPORT NEWS

Vessel	Destination	Tons
Edith ⁹	Havana, Cuba	4,200
Hugo ⁸	Ciuefuegos, Cuba	1,521
Neptune ³	Port of Spain	456
Crown of Galicia ²	Port of Spain	5,492
Crown of Galicia ²	Georgetown, B.G.	1,252
Venator ²	Cardenas, Cuba	765
Chas. G. Endicott ⁶	Casa Blanca, Mor.	1,023
Forde ²	Rio de Janeiro	2,836
Leonatus ²	Antilla, Cuba	3,206
Grove ⁵	Point a Pitre	1,433
Ludgate ¹⁰	Frey Bentos, Arg.	5,180
Munabro ²	Havana, Cuba	6,573

PHILADELPHIA

Vessel	Destination	Tons
Titania	Genoa	
Nordlys [†]	Barcelona	
Balboa [†]	Santiago	
Boden	Gothenburg	
Pathfinder [†]	Guayanilla	
Moldegaard	Havana	
Albania	Genoa	
Nordland [†]	Havana	
Iala	Buenos Aires	

BALTIMORE

Vessel	Destination	Tons
Theodore Williams	Argentina	4,098
Amelia	Cuba	771
Tenasserun	Argentina	5,694
Lewis K. Thurlow	Cuba	3,610
Andrea Costa	Italy	5,045
Neilrose	Argentina	4,671
Claveresk	Cuba	6,100

*Anthracite. † Coke.

¹ Pocahontas Fuel Co. ² Berwind-White Co. ³ Castner, Currant & Bullitt. ⁴ Baker-Whiteley Co. ⁵ Smokeless Fuel Co. ⁶ Dexter & Carpenter, Inc. ⁷ C. G. Blake Co. ⁸ New River Coal Co. ⁹ Flat Top Fuel Co. ¹⁰ C. & O. Coal Agency Co.

COASTWISE FREIGHTS

Except for a sharp demand for quick steamers ten days ago there is no material change in rates from Hampton Roads to Boston; \$2 is still the quoted freight on large tonnages, 15@25c. more being asked for small carriers to shoal water points; \$1.85 continues to be the rate from Norfolk to Providence and Fall River. \$2.50@3 is being paid for small schooners out of the Penobscot. There was a flurry in rates from New York to Long Island Sound ports for a few days, several boats being taken by New York dealers to store coal. As

high as \$1.50 was paid to Providence, but with the strike averted rates sagged off to \$1.10@1.15, and \$1.25 to New Bedford.

SHIPPING NOTES

A High Vessel Rate—A record price for a long-time charter has been obtained by the Coastwise Transportation Co. for their steamer "Suffolk." This steamer has been chartered by a Philadelphia concern for five years at a rate of \$40,000 a month. The charterers will send the "Suffolk" to South America with coal from a Chesapeake Bay port, and she will return with manganese ore.

A New Coal Vessel—A new vessel has just been added to the coal trade. She is the three-masted schooner "James M. W. Hall," owned by Rogers & Webb, of Boston, and recently launched at Phippsburg, Me. She has been chartered at a high rate to load a cargo of coal at Norfolk for Las Palmas, Canary Islands.

War Losses—The "Journal of Commerce" says that the number of merchant ships lost since the beginning of the European War up to Sept. 4, 1916, from all causes, is 1,584 with a total gross tonnage of 2,939,915.

Lake Markets

PITTSBURGH

Production unsatisfactory. Demand heavy and prices higher. New markets for high grade coals.

The coal market stiffened further last week, due to the general influence of heavier demand, shortage of cars and some shortage of labor. None of the stiffening was attributed to the threatened railroad strike, though this may possibly have been a contributing cause. This week, with the danger of a railroad strike removed, finds the market still very strong, and prices are quotable 10c. a ton higher all around, putting mine-run for prompt shipment at \$1.50 as minimum, so that the prompt market is at least up to the circular price, a price that was really ignored entirely when the bulk of the sea-son contracts were made.

Coal production last week was barely up to the average of preceding weeks, car and labor shortage interfering to a considerable extent, and as this week started with a holiday there will be a definite restriction this week. The iron and steel industry is taking its full quota of coal as it is working to maximum capacity, while local demand for spot is fair and there is frequent inquiry for high grade coal to go outside the usual tributary district. We quote: Slack, \$1.10@1.25; mine-run, \$1.50@1.60; 3/4-in., \$1.60@1.70; 1 1/4-in., \$1.70@1.80, per net ton on mine, Pittsburgh district.

BUFFALO

Some big orders given in expectation of a strike. Not much increased delivery. Some advance paid for bituminous. Rail trade active.

Bituminous—The expected flurry, based on a possible railroad strike, was on for several days. Consumers for about the first time this season saw their supply likely to be cut off and flooded the offices of shippers with orders which could not be filled. Some, with contracts calling for a car at long intervals, demanded half a dozen cars immediately, while others insisted on new orders being placed at advanced prices, when the shippers admitted their inability to fill them.

With the announcement that there would be no strike, the rushing demand ceased and the trade has been quiet though shippers are still finding it hard to get cars of any class. The mines report an increased scarcity of all cars while men are scarcer and it looks as if it would be impossible to increase the output materially for a long time.

The strikes at various mines are mostly off, but the shippers do not find coal any more plentiful, so the inference is that the consumption is increasing. Certain ambitious salesmen report a record trade.

Prices are strong, especially slack and three-quarter, with Ohio No. 8 and Allegheny Valley selling about 25c. under Pittsburgh. Regular quotations remain as follows:

	Allegheny Valley	
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Shipments by Lake are rather light, being for the week 86,000 tons, of which 38,800 tons cleared for Duluth and Superior, 13,500 tons for Milwaukee, 12,700 tons for Fort William, 10,000 tons for Green Bay, 9,300 tons for Chicago and 2,500 tons for Marquette. Rates to Lake Michigan slow tons for Marquette. Rates to Lake Michigan slow docks are about \$1 per net ton, and 85c. to fast docks. Lake Superior rates are 30 to 40c. The September anthracite circular drops all discounts, prices being flat f.o.b. cars per net ton on the basis of \$5.85 for grate, \$6.10 for egg and stove, \$6.25 for chestnut, \$5 for pea, prices of smaller sizes being furnished on application. On board vessels an addition of 25c. per ton is made.

DETROIT

Shortened supply imparts strength to steam coal trade. Slight improvement in domestic market. Some retailers advance anthracite prices. Shippers bid high for Lake boats.

Bituminous—Because of the shortage of coal usually received from the flooded district of West Virginia, there is a considerably firmer tone in the steam trade. Most of the consumers want nut, pea and slack, which, from West Virginia mines is held at \$1.50; the same price applies to three-quarter lump and mine-run is quoted \$1.45. Diversion of business to Ohio coal stiffens that market also, though prices on Ohio slack are more or less open, depending on supply. Hocking mine-run is \$1.35, three-quarter lump \$1.50 and domestic lump \$1.75.

Orders for domestic coal are coming in more freely, though not yet in large volume. There is very little coal on tracks just now.

Anthracite—Consumers and retailers are showing more interest in the anthracite situation. Announcement was made by a number of local retailers of an advance of 50c. a ton in the price of prepared sizes, Sept. 1, raising the cost to the consumer to \$8.50 for egg and stove size and \$7.75 for chestnut. Last fall each size sold for \$1 less until Oct. 1, when a 50c. advance was made. A further increase Oct. 1 this year is predicted, dealers asserting overhead expenses have greatly increased.

Lake Trade—Many of the shippers have large amounts of coal yet to be moved over the Lake routes. Vessel capacity is no more plentiful than heretofore and the outlook does not indicate it will be any easier to obtain later. Bids of 50c. a ton are being made on cargoes to be carried to ports at the head of Lake Superior. The rate to Milwaukee seems quite steady at 75c. a ton, which is a little more than double the rate at which contracts were made before navigation opened. As high as \$1 has been paid on coal sent to Chicago. The double holiday resulting from Labor Day coming after Sunday, helped shippers by causing a number of boats to load coal at lower Lake ports.

CLEVELAND

Railroad strike scare forces slack prices highest in years. Railroads taking all fuel coal they can get. Demand for Lake coal increasing. Demand exceeds production.

Up until Aug. 31 the railroad strike scare ran coal prices to the highest point reached in several years. The highest prices prevailed on coal on track at Cleveland that could be delivered to the consumer before Labor Day. Slack brought as high as \$4 net ton f.o.b. Cleveland, but coarse coals did not quite reach this mark.

Conditions also had an effect on prices for shipment but the increase was not so large. The railroads are all asking for as much fuel coal as the operators can supply them, putting no limit on what they would take from each mine.

The demand for Lake coal is increasing and conditions are coming to the point where the demand will be greater than the supply and prices will accordingly go higher.

The car situation is getting worse and fifty per cent. car supply seems to be the prevailing percentage.

It's practically impossible to give a true line on prices that will prevail the coming week f.o.b. Cleveland. Following are approximate market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 5	\$2.35	\$2.25	\$2.25
Campbell	2.35	2.25	2.25
Middle Dist.	2.25	2.15	2.15
Youngstown	2.60	2.50	2.50
Pittsburgh	2.60	2.50	2.50
Pocahontas	3.05	—	—

TOLEDO

Coal situation tight in Toledo and prices firm. Supplies scarce.

There is a scarcity all along the line and a general tightening up that is felt in every department of the trade. There is a shortage of labor everywhere which has complicated the situation to a large extent. The Lake trade shares in the general tightness. Difficulty has also been experienced in securing boats, but this has been largely a question of price and boats have been obtainable for all coal which has come in for Lake shipments upon the payment of exorbitant rates.

Dealers generally are in the market for good supplies and seem willing to pay the high prices if they can secure the coal. Slack is being

quoted here at \$1.50 and is selling close to the quotations. Domestic lump is \$2.25 to \$2.50 and mine-run from \$1.25 to \$1.50. Pocahontas is quoted at \$2.25. There is only an ordinary supply of coal at the docks. The threatened railroad strike had a large influence on the frantic efforts which are being made to secure supplies.

COLUMBUS

Trade continues strong in every department. Advanced prices well maintained. All consumers rapidly covering their requirements.

The advanced circular prices of Sept. 1 have been well maintained and in some instances, even higher prices have been secured. The possibility of a railroad strike caused a rush among the larger users and spot shipments were, for a time, selling at a premium.

The domestic trade has been active all along the line. Retailers have been placing orders liberally and many have asked for rush shipments. But on the whole the retailers accumulated stocks several weeks ago in view of the threatened strike and most of them are in fair shape. Retail prices are firm at the advanced lists. Pocahontas is selling freely and the same is true of West Virginia splints. There is also a good demand for Hocking, Jackson and Pomeroy grades. White and Red Ash are both moving in larger quantities and anthracite is strong.

Iron and steel plants have accumulated considerable supplies and the same is true of public utilities, but some of the steam users have short stocks. There is exceptional strength shown in the small sizes with nut, pea and slack selling as high as \$1.40. Railroads are taking a large tonnage for the movement of trains.

Lake trade is still active and during the past week the Toledo docks of the Hocking Valley Railway Co., handled 117,000 tons for shipment to the Northwest. Indications point to a shortage of more than 1,000,000 tons in the upper Lake region. Every effort is being made to rush as large a tonnage to the Northwest as is possible before the close of navigation.

The car shortage is apparently growing worse, especially on the West Virginia roads. As a result, production has been considerably curtailed. The Hocking Valley is about the only Ohio road with anything near a full car supply.

Prices on short tons, f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern
	lump	slag	Ohio
Rescreened lump	\$1.75	\$2.00	
Inch and a quarter	1.65	1.85	\$1.65
Three-quarter inch	1.55	1.75	1.45
Nut	1.40	1.50	1.35
Egg	1.40	1.45	
Mine run	1.35	1.40	1.30
Nut, pea and slack	1.25	1.30	1.25
Coarse slack	1.15	1.20	1.15

CINCINNATI

Transportation difficulties and improving demand have added much strength to the market. Buying is active. Available supplies in many cases are below current demands.

Threats of a general railroad strike, with an apparently increasing scarcity of cars have emphasized the difficulty in getting coal; this bids fair to increase as the season advances and demand for current consumption rises. In spite of the reduced requirements of West Virginia mines, caused by the elimination of those damaged by the flood, there are many operations working with only about 50% car supply, and the average is not estimated at higher than 60%.

With the steam demand very heavy, and prices correspondingly high for nut and slack and run-of-mine from all sections, and the domestic market losing the sluggishness which has recently characterized it, the market is in the best possible position. The only difficulty will be in meeting the demand now in evidence. Retailers are in the market in increasing numbers, realizing that they have in many cases waited too late for their winter's supply, and some increases in price to domestic consumers have been announced in consequence.

LOUISVILLE

Strike prospects created uncertainty which has left the market in a ragged condition. Car shortage serious. Prices up and some industries without fuel.

Prospects of the railway employees' strike caused strenuous efforts to be made to get coal out and all quotations were conditional and generally subject to cancellation. In fact many contracts reported are subject to cancellation, strike or no strike. Coal operators do not feel that the crisis has been bridged, but has only been set ahead, and are more or less generally disposed to fight it out without concessions to the union element.

The car shortage is still extremely trying, manufacturers dependent on the Kentucky supply, in many cases closing down for lack of fuel. Prices are most variable, subject to advance without notice or even cancellation, strike or no strike. As high as \$2 a ton, f.o.b. the mines has been asked for nut and slack, with many sales at \$1.50, block is quoted at \$2@2.40, and deliveries uncertain. The domestic movement has increased and approaching cold weather is stimulating consumer stocking operations.

Coke

CONNELLSVILLE

Prompt coke stiff but may decline later on relief of scarcity. General prospects better. Production and shipments slightly reduced.

The removal of the threat of a general railroad strike is likely to bring about an easier coke market eventually, but thus far there has been no material change. While the fact was not confessed, it is very probable that many furnaces endeavored to stock coke in the past fortnight, so that they would be able to operate their furnaces a little while longer in case of a railroad strike, though at the best they would usually have to bank within a few days if the movement of coke were stopped. The scarcity of coke is bound to continue this week as one whole day is lost on account of the holiday while all the furnaces continued in blast.

The view of operators as to the more distant future of the coke market, say for six or nine months, is decidedly more optimistic. The operators have been impressed with the demand for Pittsburgh coal, resulting in a steadily advancing coal market, with demand running over to Connellsville coal despite the disadvantage of 15c. in freight rates, and there has also been an increasing demand for byproduct coal. Still higher prices are expected for coal, even high enough possibly to make the coal bring as much profit as if it were turned into coke at about present prices. Views as to contracts for the first half of the new year have been altered and as high as \$2.75 is spoken of as a possible contract price. Thus far there has been no active negotiation. We quote: Prompt furnace, \$2.70@2.80; contract, nominal, \$2.50@2.60; spot foundry, \$3.25@3.50; contract, \$3.25@3.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Aug. 26 at 397,495 tons, a decrease of 10,565 tons, and shipments at 398,969 tons, a decrease of 9,210 tons.

Buffalo—In spite of the opening of a large number of byproduct ovens the price of coke is still firm, though it was predicted that they would be seriously affected by it. Quotations remain on the basis of \$5.25 for best 72-hr. Connellsville foundry, \$5 for 48-hr. furnace, \$4.40 for high sulphur and \$4.25 for stock.

Chicago—Coke is exuberant with a further upward tendency in prices owing to efforts to obtain reserve tonnage by retailers and foundries. But little tonnage was available this week. Byproduct domestic sizes advanced 10c. per ton on the first of the month. Nominal prices per net ton f.o.b. cars Chicago, are as follows: Connellsville, \$6@6.25; Wise County, \$6@6.25; byproduct foundry, \$6@6.25; byproduct domestic, \$4.95@5.50; gas house, \$4.50@4.75.

Middle Western

GENERAL REVIEW

Possibility of a railroad strike caused an abnormal market. Supplies short and prices rising. Speculative high prices on screenings. Increased production of coarser sizes. Smokeless very strong. Anthracite tight.

The threatened tie-up of the railroads caused a very active market over the entire West. The seriousness of the situation was intensified when railroads began to place embargoes on coal movement and gave preference to the transportation of food supplies. Screenings advanced as high as 50c. per ton over quotations made last week; Central Illinois fine coal was selling at \$1.40, and Southern Illinois as high as \$1.50. Frequent orders were placed by retailers for storage coal because of fear of a general railroad strike.

While Sept. 1 ushered in an advance on nearly all sizes, the runaway market made the new schedules appear merely nominal. Some of the railroads notified the mines that they would take their entire output, and consequently in some districts, coal for commercial purposes was exceedingly short. In nearly every district lump coal has been selling at an advance of approximately 50c. per ton compared with the previous week.

The car situation still handicaps shippers, and empties are increasingly scarce. Operators who have open tonnage available are selecting the customers to be favored—a thing unheard of since the anthracite strike of several years ago. Accumulated tonnage at the mines melted away quickly in the early part of the week and even with the proposed strike declared off, but little reaction is noted and it is expected that the natural demand during the balance of the season will be sufficient to maintain the present schedule of prices. Operators have not been so optimistic in years as at the present time.

Quite a number of wholesalers and producers have withdrawn their traveling salesmen, since more than enough orders to keep the mines running full time have been received by mail. Some Illinois companies are refusing to accept any further orders for lump, egg and nut for immediate shipment. Complaints were made by city

officials of Chicago that shippers were quoting excessive prices in the face of the city's urgent need for additional supplies to bridge over the expected strike. On Monday of this week there was enough coal delivered at the city's pumping stations to last more than three weeks.

Movement of coal up the Great Lakes is showing no increase. The tonnage for three weeks of August was about two-thirds what it was during the corresponding period a year ago, thus making an apparent shortage to date of nearly 2,600,000 tons. It is felt that this is lost tonnage and cannot be replaced by the end of the lake season. It is reported that as high as 60c. is being paid for bottoms owing to scarcity of coal at the head of the Lakes so near the end of the season. More Illinois and Indiana coal is moving Northwest, but the short car supply has retarded this expansion to some extent.

CHICAGO

Abnormally high prices prevail for screenings. Domestic coal short. Smokeless selling at a premium.

Franklin County coal, including both steam and domestic sizes, has been selling at premium prices. Some operators have withdrawn certain sizes from the market. Car supply has averaged about 50% of requirements during the week. Some large consumers have not been supplied, and Southern Illinois coals being oversold, they have been anxiously looking about for stocks.

During August the Franklin County mines shipped approximately 800,000 tons of coal, and on the last day of the month had but twelve cars on tracks unbilled, consisting mostly of No. 1 nut. The field is now producing an average of nearly 45,000 tons daily.

Franklin and Williamson County open screenings have been sold as high as \$1.50 this week, with very little free tonnage moving below \$1.25. The Williamson County situation is similar to that in Franklin County. Domestic lump and egg, Nos. 1 and 2 washed, as well as Nos. 1 and 2 nut have been selling as high as \$2.10 per ton during the week. At the close of the week the price of screenings from all Southern Illinois districts was \$1.50 per ton.

The mines in the Central Illinois district have been unable to fill the tremendous demand for steam coals from the Chicago district. Lump and egg has sold as high as \$2, while screenings have been selling freely at \$1.25. Mines in the Fulton and Peoria districts are working overtime, operators asking 10c. advance over August prices. There is every indication that the Springfield district is sold above capacity for the entire month of September.

Prices of Indiana coal have been moving steadily upward during the week. Indiana coal in storage is inconsiderable, and retailers have been scrambling for tonnage this week. Domestic lump has sold as high as \$2, while screenings have reached the \$1.50 mark. Knox County operators being mostly covered by contracts have not had any considerable quantity of open steam sizes for shipment.

Smokeless mine-run is sold up to \$1.85, with lump and egg as high as \$2.35. Inconsistent efforts on the part of retailers to get under cover on smokeless has caused premium prices to be paid. Shortage of cars and floods in the Eastern field has reduced the stocks in this territory. Owing to limited quantity of Pennsylvania smokeless arriving in this market, prices have soared to a high level.

There is a negligible quantity of West Virginia coal on the market and the same is true of Kentucky sizes, all coal in transit in the early part of the week having been sold with the result that prices were withdrawn.

Anthracite is very much stronger. Prepared sizes may advance 25c. due to shortage of supplies here. All coal in stock and in transit has been sold quickly this week. It is expected that consumers will actively seek anthracite in September to supply the deficiency of the last two months, and a much better turn-over is looked for in that month. On Sept. 1 domestic sizes took the usual 10c. increase, while no change was made in the price of buckwheat.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars mines:

Wilms. and Frank. Cos.	Spring- field	Fulton and Peoria	Clinton	Green and Knox Cos.
Lump.....	\$1.85@2.10	\$1.85@1.90	\$1.70@1.80	\$1.75@1.80
Steam lump.....	1.45@1.60	1.65@1.75	1.45@1.60	1.50@1.60
2½ and 3-in. lump.....				1.75
1½-in. lump.....				
Egg.....	1.85@2.10	1.85@1.90	1.65@1.75	1.60@1.70
Nut.....	1.90@2.10	1.75@1.90	1.35@1.50	1.50@1.65
No. 1 washed.....	1.90@2.10			
No. 2 washed.....	1.90@2.10			
No. 1 nut.....	1.90@2.10			
No. 2 nut.....	1.90@2.10			
Mine-run.....	1.60@1.75	1.45@1.50	1.35@1.45	1.40@1.50
Screenings.....	1.40@1.50	1.40@1.50	1.25@1.50	1.35@1.50
				1.50
Lump.....	\$1.85@2.10	\$2.00@2.75	\$2.10@2.35	\$2.10@2.35
1½-in. lump.....	1.65@1.75			2.00
Egg.....	1.85@2.10	1.65@2.25	2.00@2.35	2.00@2.35
Nut.....	1.90@2.10	1.40@1.75		
No. 1 nut.....	1.90@2.10			
No. 2 nut.....	1.90@2.10			
Mine-run.....	1.50	1.50	1.75	1.75
Screenings.....	1.40@1.50	1.25		

W. Va. splint \$2.00@2.10

General Statistics

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the Pennsylvania Railroad Co.'s lines east of Pittsburgh and Erie for July and the seven months of 1915 and 1916, in short tons:

	1916	1915	1916	1915
Anthracite.....	906,509	653,020	6,766,550	6,068,036
Bituminous.....	4,014,712	3,668,146	28,283,849	23,855,500
Coke.....	1,156,559	1,091,344	8,508,352	6,088,195
Total.....	6,077,780	5,412,510	43,558,751	30,011,731

COAL MOVEMENT

Fuel shipments over 13 leading Eastern carriers for May and 5 months of 1915-16 were as follows, in short tons:

	Classes and Railroads	May	1915	1916	5 Months
Anthracite:					
Baltimore & Ohio.....	93,698	78,194	526,828	675,329	
Buffalo, Rochester & Pittsburgh.....	12,234	20,024	77,043	79,980	
Buffalo & Susquehanna.....	464	289	3,049	2,913	
Chesapeake & Ohio.....	1,367	748	5,060	4,390	
Erie.....	682,775	738,326	3,533,164	4,085,655	
Huntingdon & Broad Top Mountain.....	31	124	133	259	
Pennsylvania.....	972,995	957,091	4,571,963	4,952,149	
Pittsburgh, Shawmut & Northern.....	866	438	5,675	5,267	
Virginian.....	296	460	519	1,153	
Western Maryland.....	33,136	24,962	136,226	140,018	
Total.....	1,797,862	1,820,656	8,859,660	9,950,322	

	May	1915	1916	5 Months
Bituminous:				
Baltimore & Ohio.....	2,723,221	3,103,443	11,730,282	14,395,900
Buffalo, Rochester & Pittsburgh.....	599,229	670,352	2,810,091	3,885,304
Buffalo & Susquehanna.....	73,565	94,934	396,547	599,223
Chesapeake & Ohio.....	1,911,315	2,544,094	8,093,417	11,251,575
Erie.....	483,920	637,421	2,460,853	3,893,257
Huntingdon & Broad Top Mountain.....	74,536	79,496	384,035	493,380
New York Central (Buffalo and east).....	462,728	590,354	2,415,492	3,445,089
Norfolk & Western.....	2,152,792	2,811,849	8,785,854	12,499,519
Pennsylvania.....	3,393,328	3,926,050	16,522,651	20,524,490
Pittsburgh, Shawmut & Northern.....	147,010	259,154	868,346	1,230,269
Virginian.....	289,381	409,308	1,503,181	2,219,358
Western Maryland.....	717,595	608,274	3,255,633	3,231,768
Total.....	13,028,620	15,734,729	59,226,382	77,669,141

MIDDLE WESTERN ROADS

The following is a comparative statement of coal handled by the 17 principal Middle Western carriers for the month of April, and the first four months of 1915 and 1916:

	April	1915	1916	Four Months
Illinois Central RR.....	432,885	398,407	2,492,963	3,368,113
C. & E. I. R.R.....	361,925	214,200	2,132,916	2,804,089
C. B. & Q. R.R.....	284,944	278,743	1,823,903	2,299,926
C. C. C. & St. L. R.R.....	326,255	170,507	1,723,991	2,000,574
Vandalia R.R.....	351,917	222,878	1,705,000	1,907,712
C. T. H. & S. E. Ry.....	225,851	140,480	1,098,397	1,364,737
C. & A. Ry.....	129,996	99,912	650,963	952,255
Wabash R.R.....	98,584	73,737	564,879	660,125
St. L. I. M. & S. Ry.....	98,879	75,165	488,403	529,215
Southern Ry.....	78,515	93,998	370,152	683,433
B. O. S. & W. R.R.....	61,355	37,980	368,785	267,853
St. L. T. & E. R.R.....	36,207	40,987	211,937	281,827
St. L. & O. F. Ry.....	38,906	31,337	216,102	253,982
L. & M. Ry.....	26,471	33,156	205,515	208,808
C. I. & L. Ry.....	28,392	36,178	193,842	254,947
C. P. & St. L. Ry.....	28,077	20,574	152,013	197,440
C. & N. W. Ry.....	27,764	21,700	146,915	220,403

Kanawha, Glen Jean & Eastern Ry. to and from its junction points with the trunk lines.

3. Rental reserved in a lease of the White Oak Ry. to the Chesapeake & Ohio and the Virginian railways discussed.

Foreign Markets

GREAT BRITAIN

Aug. 23.—The market continues firm with a strong demand for Admiralty purposes and consequent scarcity of free coal. Quotations are as follows:

Best Welsh steam.....	Nominal
Best seconds.....	Nominal
Seconds.....	\$11.04@11.28
Best dry coals.....	9.60@10.20
Best Monmouthshires.....	11.04@11.28
Seconds.....	10.56@10.89
Best Cardiff smalls.....	6.96@7.20
Cargo smalls.....	4.80@5.40

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—The freight market is exceedingly quiet with small demand for tonnage. Rates are weaker in most directions. Quotations are as follows:

Gibraltar.....	\$6.60	Port Said.....	\$14.40
Genoa.....	14.40	Las Palmas.....	7.20
Naples.....	14.40	St. Vincent.....	7.80
Alexandria.....	17.00	River Plate.....	